Product catalogue 2025

Piping systems

www.fvplast.com

FROM THE FOUNDING OF THE COMPANY TO THE TOP IN THE INDUSTRY

THE LEADER AMONG NEW GENERATION POLYPROPYLENE PROCESSORS PP-RCT

FV – Plast is the largest manufacturer of PP-RCT pipes and fittings in Central and Eastern Europe with the widest range of PP-RCT pipes. In addition to this modern raw material, we also buy other high-quality plastic granules, brass and other raw materials for our products in Europe.

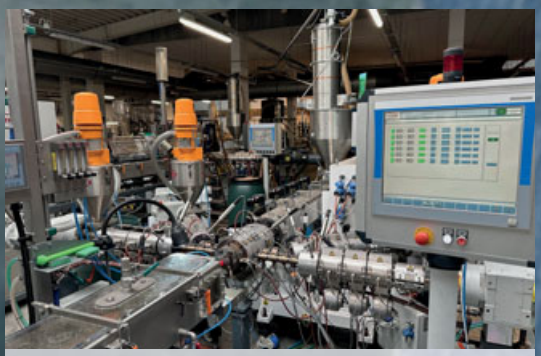
EXPORT WORLDWIDE

Our export department is in daily contact with customers from almost all over the world. The majority of our production volume travels to 40 countries on four continents. Our quality and innovative products thus help to improve life around the planet.

FV – Plast, as was founded in 1990 with the aim of producing quality plastic piping systems for water distribution and heating. After more than 30 years of production, development and innovation, it now processes polyethylenes, polypropylenes and polybutylenes into many types of pipes, fittings and accessories. Gradually, it reached the top of Czech manufacturers and suppliers of plumbing installation systems, floor heating and ceiling cooling systems.

WORLD QUALITY FROM CZECH HANDS

Thanks to the skill of our technicians and the sophistication of the latest world technologies, we produce first-class pipes and fittings that will withstand all world markets. The quality is proven by the certificates of many world testing laboratories. The quality management system, together with internal tests of raw materials and finished products in our own, modern laboratory allows us to provide our products with up to 15 years of warranty.



TOP TECHNOLOGIES

Our production is fully automated and we are constantly improving it. Based on the latest knowledge from around the world, we develop state-of-the-art equipment for the production of our products. In order to stay at the top of the world, we invest in research into modern technologies and use cooperation with research and technology centers in the Czech Republic. We are the only manufacturer of PE-RT/AL/PE-RT multilayer pipes and PE-RT in the Czech Republic

EXPLANATIONS OF GRAPHIC SYMBOLS

Dimension	Unit	Quantity in a large package	Quantity in a small package	Weight * [kg / unit]	Volume [dm³/unit]

# ●	Pipes and fittings in gray colour
# ●	Pipes and fittings in green colour

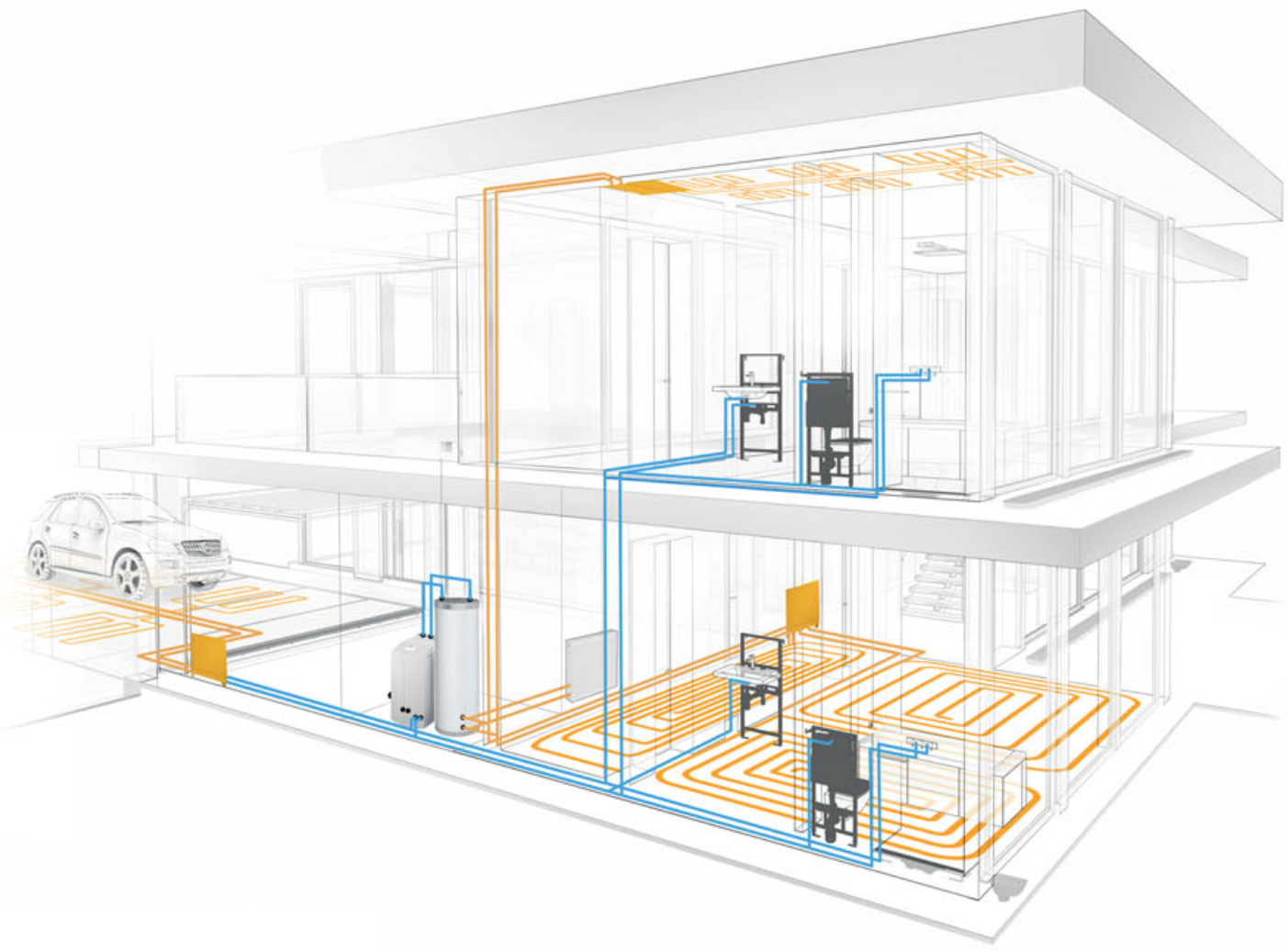
Note: Typographical errors reserved.
* Actual weight may slightly vary within the tolerances specified in the relevant standards.

CONTENT

OVERVIEW OF THE USE OF FV ELEMENTS

AQUA

COMFORT



The portfolio of FV – Plast is divided into two system groups:

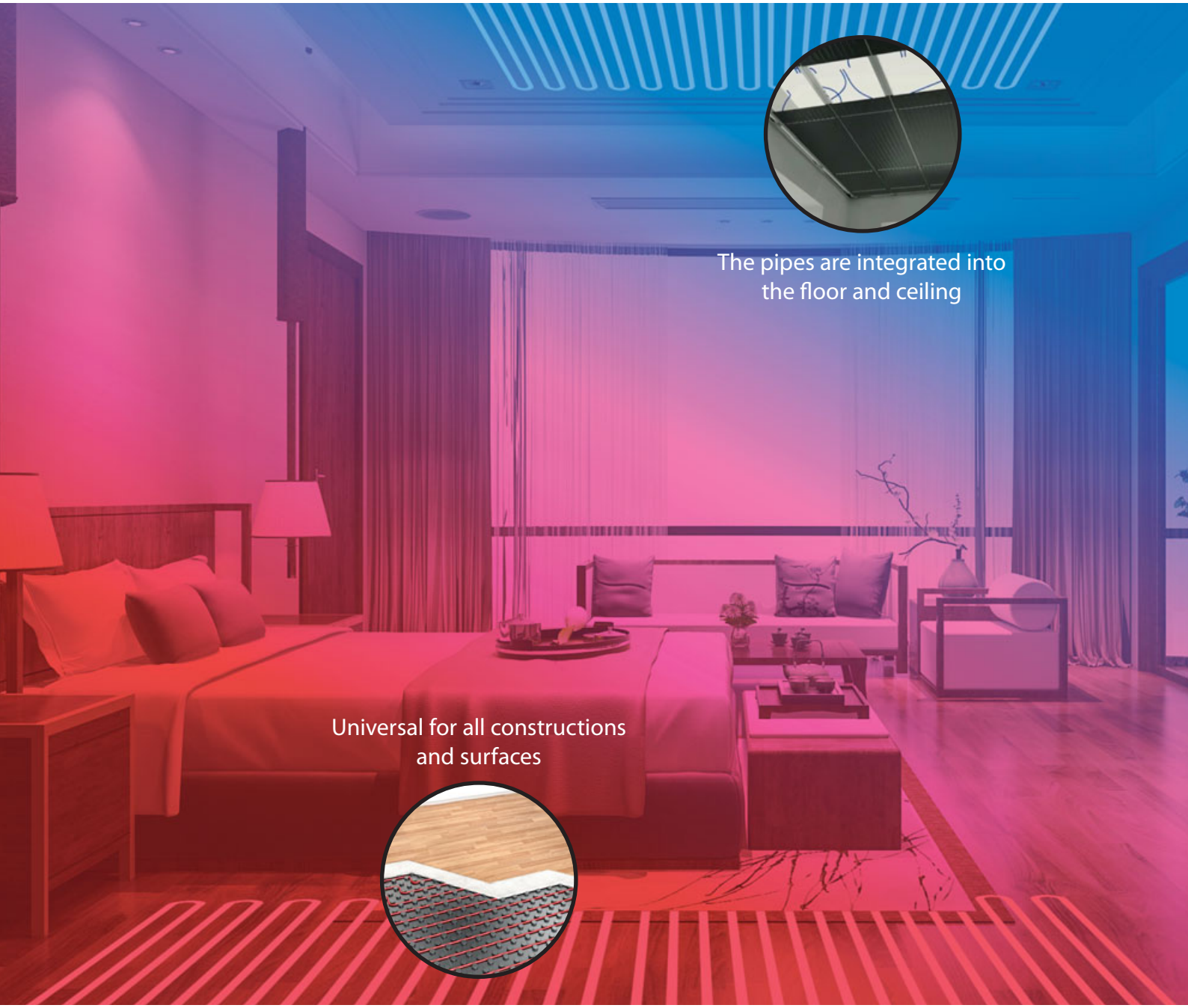
- AQUA system for complete solution of water in residential and industrial buildings
- COMFORT system for underfloor, wall and ceiling heating and cooling

		Cold water	Air conditioning, cooling water	Hot water	Underfloor heating	Low temperature heating distribution	High temperature heating distribution	Air distribution
AQUA	FV PP-R CLASSIC S2.5 SDR6 (PN 20)	✓	✓	✓		✓		✓
	FV PP-RCT UNI	✓✓	✓	✓		✓		✓
	FV PP-RCT HOT	✓	✓	✓✓		✓		✓
	FV PP-RCT FASER HOT	✓	✓	✓✓		✓✓	✓	✓
	FV MULTIPERT AL	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	
	Fittings FV PP-R and FV PP-RCT	✓✓	✓✓	✓✓	✓	✓✓	✓✓	✓
	Fittings FV PRESS	✓	✓	✓✓	✓✓	✓✓	✓✓	
COMFORT	FV MULTIPERT-5				✓✓	✓	✓✓	
	FV MULTIPERT AL	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	
	FV COOLING PE-RT		✓✓		✓✓	✓	✓	

Explanations: ✓✓ Preferred area of application
✓ Suitable application area

…more than pipes

COMFORT
HEATING AND COOLING
ALL IN ONE



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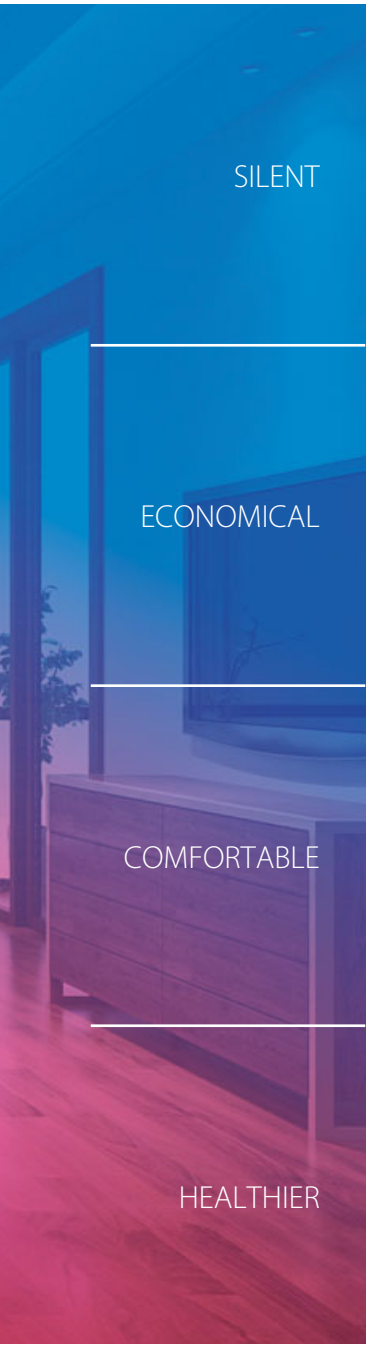
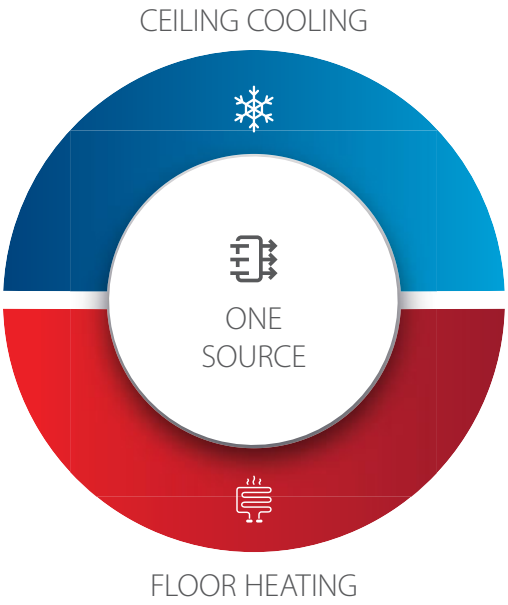


COMPLEX SOLUTION

We offer a unique system of floor heating and ceiling cooling for optimal thermal comfort in family houses, apartments and commercial spaces.



IMPLEMENTATION SUPPORT

- We will prepare a project for your customers free of charge.
- We will supply all system components, including distributions.
- We offer training and support during installation.
- Assembly is easy and fast.
- The system operates smoothly, resulting in minimal maintenance requirements.

10 YEAR WARRANTY

50 YEARS LIFETIME

COMFORT

You will find the complete COMFORT range on page 64

A NEW GENERATION OF PP-RCT DISTRIBUTION

37%* HIGHER FLOW COMPARED TO PP-R PIPES

The new generation of FV PP-RCT pipes uses the excellent properties of PP-RCT material in all-plastic and multilayer pipes.
The PP-RCT material is able to achieve the same or better pressure and temperature resistance as PP-R pipes with a lower wall thickness.**

Proven method of joining by polyfusion welding as PP-R

Higher operating temperature range for a given application

3× lower thermal expansion than PP-R pipes (for FV PP-RCT FASER)

50 YEARS

More than 50 years of longevity

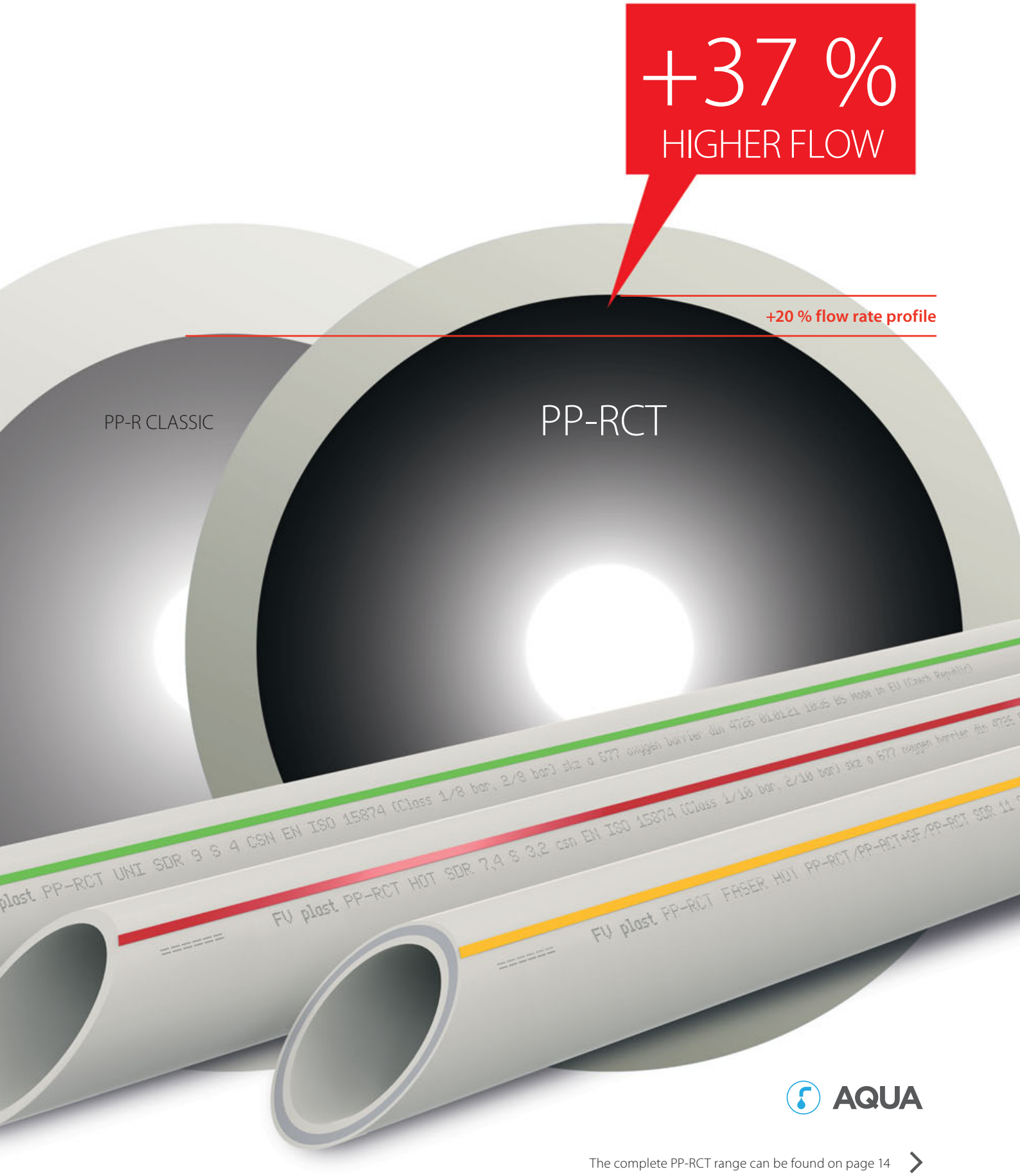
COMPATIBILITY WITH OLDER DISTRIBUTION PP-R CLASSIC

You can connect PP-RCT pipes to older PP-R CLASSIC distribution lines without any problems

EARLY PIPES FV PP-R CLASSIC		4TH PIPES GENERATION FV PP-RCT
CLASSIC PN16	>	FV PP-RCT UNI
CLASSIC PN20	>	FV PP-RCT HOT
FASER PN20	>	FV PP-RCT FASER HOT

15 YEAR WARRANTY ON PP-RCT PIPES

* compared to PP-R pipes PN20
** calculated value for PP-RCT HOT PN26



AQUA

The complete PP-RCT range can be found on page 14

The widest range for plumbing installations made of polypropylene 4th generation

AQUA

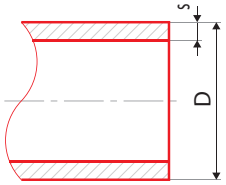
- **FV PP-RCT (welding)**
  - PV PP-RCT pipes
  - FV PP-RCT fittings
    - All-plastic fittings
    - Combined fittings
    - Shut-off valves
    - Fittings for butt welding
  - Tools, equipment, accessories
  - Assembly instructions
- **FV PRESS (pressing)**
  - MULTIPERT-AL pipes
  - FV PRESS brass press fittings
  - Tools
  - Assembly instructions for FV PRESS

FV PP-RCT PIPES

FV PP-RCT UNI

System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874

Note: Suitable for water distribution to 60 °C and compressed air. For application in systems to 20 °C/1.6 MPa – 60 °C/0.8 MPa. For d20 to d50 also available in 3 m length, see price list.

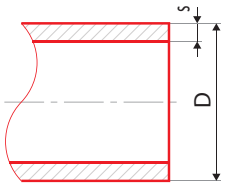


						#	#	D [mm]	s [mm]	SDR (S)	l [m]
16 × 2.2	m	160		0.095	0.28	AA110016004	BA110160004	16	2.2	7.4 (3.2)	4
20 × 2.3	m	100		0.127	0.44	AA110020004	BA110020004	20	2.3	9 (4)	4
25 × 2.8	m	60		0.191	0.73	AA110025004	BA110025004	25	2.8	9 (4)	4
32 × 3.6	m	40		0.261	1.10	AA110032004	BA110032004	32	3.6	9 (4)	4
40 × 3.7	m	24		0.412	1.83	AA110040004	BA110040004	40	3.7	11 (5)	4
50 × 4.6	m	16		0.638	2.75	AA110050004	BA110050004	50	4.6	11 (5)	4
63 × 5.8	m	12		1.010	4.07	AA110063004	BA110063004	63	5.8	11 (5)	4
75 × 6.8	m	8		1.410	5.50	AA110075004	BA110075004	75	6.8	11 (5)	4
90 × 8.2	m	4		2.030	9.17	AA110090004	BA110090004	90	8.2	11 (5)	4
110 × 10	m	4		3.010	10.31	AA110110004	BA110110004	110	10.0	11 (5)	4
125 × 11.4	m	4		3.910	12.27		BA110125004	125	11.4	11 (5)	4
160 × 14.6	m	4		6.380	20.10		BA110160004	160	14.6	11 (5)	4
200 × 18.2	m	4		9.950	31.40		BA110200004	200	18.2	11 (5)	4
250 × 22.7	m	4		15.500	49.06		BA110250004	250	22.7	11 (5)	4

FV PP-RCT HOT

System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874

Note: Suitable for hot water distribution. For application in systems 20 °C/2.0 MPa – 70 °C/1.0 MPa. For d20 to d50 also available in 3 m length, see price list.

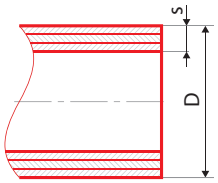


						#	#	D [mm]	s [mm]	SDR (S)	l [m]
20 × 2.8	m	100		0.148	0.44	AA112020004	BA112020004	20	2.8	7.4 (3.2)	4
25 × 3.5	m	60		0.230	0.73	AA112025004	BA112025004	25	3.5	7.4 (3.2)	4
32 × 4.4	m	40		0.370	1.10	AA112032004	BA112032004	32	4.4	7.4 (3.2)	4
40 × 5.5	m	24		0.585	1.83	AA112040004	BA112040004	40	5.5	7.4 (3.2)	4
50 × 6.9	m	16		0.896	2.75	AA112050004	BA112050004	50	6.9	7.4 (3.2)	4
63 × 8.6	m	12		1.410	4.07	AA112063004	BA112063004	63	8.6	7.4 (3.2)	4
75 × 10.3	m	8		2.010	5.50	AA112075004	BA112075004	75	10.3	7.4 (3.2)	4
90 × 12.3	m	4		2.870	9.17	AA112090004	BA112090004	90	12.3	7.4 (3.2)	4
110 × 15.1	m	4		4.300	10.31	AA112110004	BA112110004	110	15.1	7.4 (3.2)	4

FV PP-RCT FASER HOT

System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874

Note: Suitable for hot water distribution. For application in systems 20 °C/2.0 MPa – 70 °C/1.0 MPa to D=125 and 20 °C/1.6 MPa – 70 °C/0.8 MPa to D=160 and even larger. 3× lower thermal expansion compared to single-layer PP-RCT. For d20 to d50 also available in 3 m length, see price list.

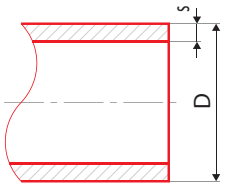


						#	#	D [mm]	s [mm]	SDR (S)	l [m]
20 × 2.8	m	100		0.151	0.44	AA113020004	BA113020004	20	2.8	7 (3.2)	4
25 × 3.5	m	60		0.232	0.73	AA113025004	BA113025004	25	3.5	7 (3.2)	4
32 × 3.6	m	40		0.340	1.10	AA113032004	BA113032004	32	3.6	9 (4)	4
40 × 4.5	m	24		0.513	1.83	AA113040004	BA113040004	40	4.5	9 (4)	4
50 × 5.6	m	16		0.746	2.75	AA113050004	BA113050004	50	5.6	9 (4)	4
63 × 7.1	m	12		0.190	4.07	AA113063004	BA113063004	63	7.1	9 (4)	4
75 × 8.4	m	8		1.700	5.50	AA113075004	BA113075004	75	8.4	9 (4)	4
90 × 10.1	m	4		2.400	9.17	AA113090004	BA113090004	90	10.1	9 (4)	4
110 × 12.3	m	4		3.400	10.31	AA113110004	BA113110004	110	12.3	9 (4)	4
125 × 14.0	m	4		4.480	12.27		BA113125004	125	14.0	9 (4)	4
160 × 14.6	m	4		6.775	20.10		BA113160004	160	14.6	11 (5)	4
200 × 18.2	m	4		10.640	31.40		BA113200004	200	18.2	11 (5)	4
250 × 22.7	m	4		16.610	49.06		BA113250004	250	22.7	11 (5)	4

FV PP-R CLASSIC S2.5 SDR6 (PN 20)

System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874

Note: Pipe of the highest pressure series in straight pieces, suitable for hot water distribution in high-rise buildings. Its high chemical resistance makes it suitable for industry and agriculture.

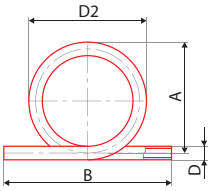


						#	#	D [mm]	s [mm]	l [m]
16 × 2.7	m	160		0.11	0.28	AA101016004	BA101016004	16	2.70	4
20 × 3.4	m	100		0.17	0.44	AA101020004	BA101020004	20	3.40	4
25 × 4.2	m	60		0.27	0.73	AA101025004	BA101025004	25	4.20	4
32 × 5.4	m	40		0.43	1.10	AA101032004	BA101032004	32	5.40	4
40 × 6.7	m	24		0.67	1.83	AA101040004	BA101040004	40	6.70	4
50 × 8.3	m	16		1.00	2.75		BA101050004	50	8.30	4
63 × 10.5	m	12		1.65	4.07		BA101063004	63	10.50	4
75 × 12.5	m	8		2.34	5.50		BA101075004	75	12.50	4
90 × 15.0	m	4		3.36	9.17		BA101090004	90	15.00	4
110 × 18.3	m	4		5.01	10.31		BA101110004	110	18.30	4

FV PP-RCT ALL-PLASTIC FITTINGS

FV PP-RCT compensation loop

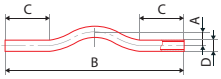
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Prevents deformation of the pipe caused by thermal length expansion.



16	pcs	10	1	0.07	1.60	AA232016000	BA232016000	16	188.0	180	290
20	pcs	6	1	0.11	1.60	AA232020000	BA232020000	20	210.0	200	300
25	pcs	5	1	0.21	3.20	AA232025000	BA232025000	25	217.5	205	370
32	pcs	4	1	0.43	8.00	AA232032000	BA232032000	32	231.0	215	400
40	pcs	2	1	0.67	8.00	AA232040000	BA232040000	40	295.0	275	420

FV PP-RCT crossover

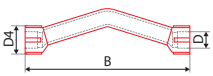
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Enables crossing of individual water and heating distribution routes. Most often used in floor piping or when avoiding risers.



16	pcs	180	1	0.03	0.24	AA233016000	BA233016000	16	35	380	100
20	pcs	100	1	0.07	0.32	AA233020000	BA233020000	20	42	400	110
25	pcs	50	1	0.09	0.64	AA233025000	BA233025000	25	30	400	100
32	pcs	35	1	0.16	0.80	AA233032000	BA233032000	32	35	400	90
40	pcs	20	1	0.33	1.60	AA233040000	BA233040000	40	35	400	90

FV PP-R crossover with socket

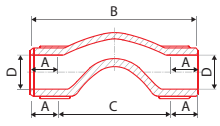
System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874
Note: Allows crossing of pipelines, socket end saves time during installation.



20	pcs	100	1	0.07	0.24	AA246020000	BA246020000	31	188	20
25	pcs	50	1	0.09	0.32	AA246025000	BA246025000	37	198	25

FV PP-RCT crossover with socket, short

System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Allows crossing of pipes with minimal space occupation, the necked end saves time during installation.

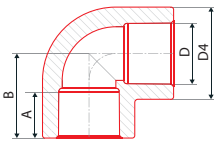


20	pcs	160	10	0.029	0.117	AA246020001	BA246020001	20	14.5	88	59
25	pcs	100	5	0.044	0.187	AA246025001	BA246025001	25	16	97	65

FV PP-R/PP-RCT elbow 90°

System: **AQUA**
Material: PP-R/PP-RCT
Standard: ČSN EN ISO 15874

Note: Change of direction with minimum pressure loss, maintains pipe clearance.

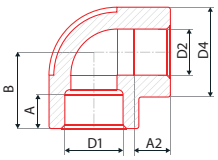


16	pcs	200	50	0.01	0.05	AA202016000	BA202016000	16	24	13.3	22.0
20	pcs	300	50	0.02	0.07	AA202020000	BA202020000	20	29	14.5	25.5
25	pcs	150	25	0.03	0.12	AA202025000	BA202025000	25	37	16.0	29.0
32	pcs	80	10	0.06	0.24	AA202032000	BA202032000	32	46	18.1	34.2
40	pcs	40	4	0.082	0.53	AA202040000	BA202040000	40	54.5	20.5	41.5
50	pcs	30	2	0.19	0.96	AA202050000	BA202050000	50	73	23.5	48.5
63	pcs	10	2	0.37	1.92	AA202063000	BA202063000	63	94	27.4	59.2
75	pcs	6	1	0.396	3.20	AA202075000	BA202075000	75	101	31.0	67.7
90	pcs	6	1	0.575	4.3	AA202090000	BA202090000	90	113.5	35.5	78.4
110	pcs	3	1	1.38	5.5	AA202110000	BA202110000	110	151	41.5	98
125	pcs	1	1	2.05	7.04		BA202125000	125	165	40	124

FV PP-R elbow 90° reduced

System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874

Note: Change of direction and reduction of pipe clearance with minimum pressure loss.

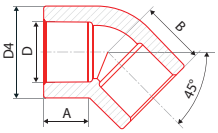


25	pcs	100	10	0.09	0.32	AA211025020	BA211025020	25	20	36.3	16	32.2

FV PP-R/PP-RCT elbow 45°

System: **AQUA**
Material: PP-R/PP-RCT
Standard: ČSN EN ISO 15874

Note: Change of direction with minimum pressure loss, maintains pipe clearance.

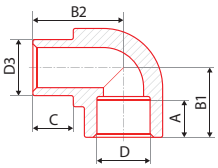


16	pcs	200	50	0.01	0.03	AA203016000	BA203016000	16	24.3	13.3	17.5
20	pcs	400	50	0.02	0.07	AA203020000	BA203020000	20	29.1	14.5	19.5
25	pcs	200	25	0.03	0.12	AA203025000	BA203025000	25	36.8	16.0	22.0
32	pcs	80	10	0.06	0.24	AA203032000	BA203032000	32	46.0	18.1	25.5
40	pcs	30	10	0.11	0.53	AA203040000	BA203040000	40	59.0	20.5	30.0
50	pcs	28	4	0.92	0.5	AA203050000	BA203050000	50	64.8	25.2	34.5
63	pcs	10	2	0.173	1.5	AA203063000	BA203063000	63	81.8	31	44.5
75	pcs	6	1	0.52	2.25	AA203075000	BA203075000	75	99.0	30.0	48.0
90	pcs	6	1	0.385	3.0	AA203090000	BA203090000	90	115	33.0	54.1
110	pcs	4	1	0.678	3.11	AA203110000	BA203110000	110	140.5	37.0	69.0
125	pcs	2	1	1.40	7.04		BA203125000	125	165	40.0	77.0

FV PP-R elbow 90° internal/external

System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874

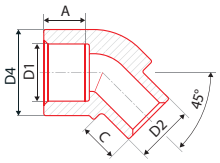
Note: Change of direction with minimum pressure loss, maintains pipe clearance.



20	pcs	400	50	0.01	0.05	AA204020000	BA204020000	20	14.5	25.6	29.0	14.5
25	pcs	200	25	0.03	0.14	AA204025000	BA204025000	25	16.0	31.5	35.4	14.8
32	pcs	100	20	0.07	0.22	AA204032000	BA204032000	32	18.0	36.5	42.2	16.0

FV PP-R elbow 45° internal/external

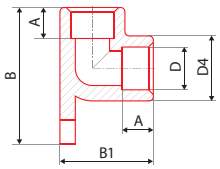
System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874
Note: Change of direction with minimum pressure loss, maintains pipe clearance.



						#	#	D1 [mm]	D2 [mm]	D4 [mm]	A [mm]	C [mm]
16	pcs	280	20	0.010	0.04	AA205016000	BA205016000	16	16	24.2	13.3	12.5
20	pcs	200	20	0.020	0.07	AA205020000	BA205020000	20	20	29.5	14.5	14.8
25	pcs	100	10	0.026	0.07	AA205025000		25	25	36.3	18.3	17.3

FV PP-R elbow 90° for wall mounting, welding

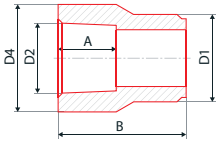
System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874
Note: Fixes the wall conduit before the end welding fitting.



						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]	B1 [mm]
20	pcs	60	10	0.02	0.16	AA206020000	BA206020000	20	30.2	14.5	48.5	43.5
25	pcs	40	10	0.04	0.32	AA206025000	BA206025000	25	35.3	16.0	76.2	51.0

FV PP-R/PP-RCT reducer internal/external

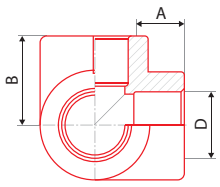
System: **AQUA**
Material: PP-R/PP-RCT
Standard: ČSN EN ISO 15874
Note: Connecting pipes of different diameters with low pressure loss.



						#	#	D1 [mm]	D2 [mm]	D4 [mm]	A [mm]	B [mm]
20 × 16	pcs	400	50	0.01	0.02	AA210020016	BA210020016	20	16	24.0	13.3	28.4
25 × 16	pcs	300	50	0.01	0.03	AA210025016	BA210025016	25	16	30.1	13.3	31.8
25 × 20	pcs	400	50	0.01	0.05	AA210025020	BA210025020	25	20	30.1	14.5	34.2
25 × 20	pcs	400	50	0.01	0.05	AA210032025	BA210025020	25	20	30.1	14.5	34.2
32 × 25	pcs	200	10	0.03	0.12	AA210032025	BA210032025	32	25	36.0	16.0	38.9
40 × 20	pcs	180	10	0.02	0.13	AA210040020	BA210040020	40	20	40.0	14.5	41.5
40 × 25	pcs	180	10	0.03	0.16	AA210040025	BA210040025	40	25	37.9	16.0	43.5
40 × 32	pcs	120	10	0.04	0.24	AA210040032	BA210040032	40	32	47.3	18.1	50.7
50 × 32	pcs	80	10	0.05	0.27	AA210050032	BA210050032	50	32	50.3	18.1	50.7
50 × 40	pcs	60	10	0.05	0.30	AA210050040	BA210050040	50	40	60.5	20.5	49.8
63 × 32	pcs	60	10	0.07	0.32	AA210063032	BA210063032	63	32	48.2	18.1	43.5
63 × 40	pcs	50	10	0.08	0.40	AA210063040	BA210063040	63	40	59.7	20.5	52.0
63 × 50	pcs	40	10	0.12	0.60	AA210063050	BA210063050	63	50	74.3	23.5	62.0
75 × 50	pcs	20	5	0.12	0.80	AA210075050	BA210075050	75	50	93.2	23.5	57.5
75 × 63	pcs	24	2	0.21	1.37	AA210075063	BA210075063	75	63	93.2	27.4	72.2
90 × 63	pcs	25	1	0.24	0.98	AA210090063	BA210090063	90	63	94.8	27.4	70.8
90 × 75	pcs	20	1	0.27	2.40	AA210090075	BA210090075	90	75	106.0	31.0	73.2
110 × 90	pcs	9	1	0.50	2.80	AA210110090	BA210110090	110	90	125.8	35.5	91.7
125 × 110	pcs	3	1	1.03	3.52		BA210125110	125	110	134.6	85.0	225

FV PP-R/PP-RCT three-way elbow

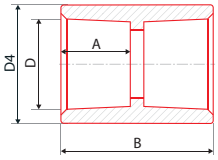
System: **AQUA**
Material: PP-R/PP-RCT
Standard: ČSN EN ISO 15874
Note: Change of direction with minimum pressure loss, maintains pipe clearance.



						#	#	D [mm]	A [mm]	B [mm]
20	pcs	50	10	0.03	0.13	AA242020000	BA242020000	20	14.5	26.8
25	pcs	50	10	0.04	0.17	AA242025000	BA242025000	25	16.0	29.5
32	pcs	20	5	0.05	0.20	AA242032000	BA242032000	32	18.0	35.0

FV PP-R/PP-RCT sleeve

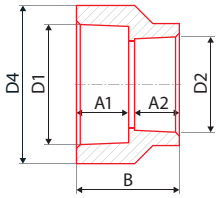
System: **AQUA**
Material: PP-R/PP-RCT
Standard: ČSN EN ISO 15874
Note: Reliable pipe connection with reduced pressure loss.



						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]
16	pcs	300	50	0.01	0.03	AA201016000	BA201016000	16	24.10	13.3	29.6
20	pcs	400	50	0.01	0.05	AA201020000	BA201020000	20	29.10	14.5	32.0
25	pcs	200	25	0.03	0.10	AA201025000	BA201025000	25	36.70	16.0	35.5
32	pcs	100	10	0.04	0.19	AA201032000	BA201032000	32	46.20	18.1	38.3
40	pcs	100	10	0.051	0.196	AA201040000	BA201040000	40	57	20.5	45.4
50	pcs	40	4	0.076	0.45	AA201050000	BA201050000	50	70	23.5	53.5
63	pcs	30	2	0.132	0.54	AA201063000	BA201063000	63	84	27.4	60
75	pcs	15	1	0.27	1.92	AA201075000	BA201075000	75	108.5	31.0	66.5
90	pcs	10	1	0.42	2.40	AA201090000	BA201090000	90	127.3	35.5	73.6
110	pcs	4	1	0.457	2.25	AA201110000	BA201110000	110	136	41.5	85
125	pcs	1	1	0.75	2.45		BA201125000	125	165.0	40.0	90.0

FV PP-R reducer

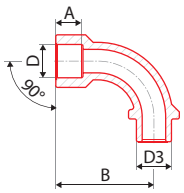
System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874
Note: Connecting pipes of different diameters with reduced pressure loss.



						#	#	D1 [mm]	D2 [mm]	D4 [mm]	A1/A2 [mm]	B [mm]
20 × 16	pcs	400	50	0.01	0.05	AA209020016	BA209020016	20	16	29.0	14.5/13.3	33.0
25 × 20	pcs	300	50	0.02	0.11	AA209025020	BA209025020	25	20	36.7	16/14.5	34.3
32 × 20	pcs	180	10	0.02	0.13	AA209032020	BA209032020	32	20	46.3	18.1/14.5	35.0
32 × 25	pcs	150	10	0.03	0.13	AA209032025	BA209032025	32	25	47.1	18.1/16	38.0
50 × 40	pcs	40	4	0.09	0.60	AA209050040	BA209050040	50	40	68.4	23.5/20.5	47.0
63 × 50	pcs	24	2	0.17	0.80	AA209063050	BA209063050	63	50	93.2	27.4/23.5	54.0

FV PP-RCT bend 90° int/ext

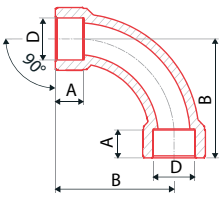
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Change of direction with minimum pressure loss, maintains pipe clearance.



						#	D [mm]	D3 [mm]	A [mm]	B [mm]
20	pcs	100	10	0.024	0.18	AA241020000	20	20	13	56

FV PP-R elbow 90° connector

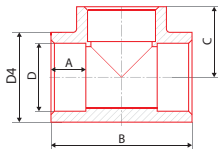
System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874
Note: Change of direction with minimum pressure loss, maintains pipe clearance.



						#	#	D [mm]	A [mm]	B [mm]
20	pcs	125	1	0.024	0.144	AA259020000	BA259020000	20	14.5	56
25	pcs	100	1	0.049	0.216	AA259025000	BA259025000	25	16	68.5
32	pcs	50	1	0.100	0.432	AA259032000	BA259032000	32	18	85.5
40	pcs	25	1	0.193	0.864	AA259040000	BA259040000	40	20.5	106

FV PP-R/PP-RCT tee non-reversible

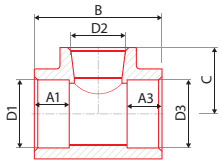
System: **AQUA**
Material: PP-R/PP-RCT
Standard: ČSN EN ISO 15874
Note: Shaped fitting for branch distribution with minimal pressure loss.



						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]	C [mm]
16	pcs	150	50	0.02	0.08	AA208016000	BA208016000	16	24.6	13.3	44	23.0
20	pcs	160	20	0.03	0.12	AA208020000	BA208020000	20	29.0	14.5	51	25.5
25	pcs	120	20	0.04	0.24	AA208025000	BA208025000	25	36.5	16.0	59	31.4
32	pcs	60	10	0.08	0.40	AA208032000	BA208032000	32	45.3	18.1	71	35.0
40	pcs	48	4	0.13	0.96	AA208040000	BA208040000	40	58.0	20.5	83	41.5
50	pcs	22	2	0.25	0.98	AA208050000	BA208050000	50	68	23.5	99	49.0
63	pcs	9	1	0.35	2	AA208063000	BA208063000	63	85	27.4	120	60.0
75	pcs	6	1	0.51	3.6	AA208075000	BA208075000	75	100.2	31.0	142	68.5
90	pcs	5	1	0.71	3.6	AA208090000	BA208090000	90	115.2	35.5	150	80.5
110	pcs	2	1	1.78	5.5	AA208110000	BA208110000	110	152.6	41.5	186	97
125	pcs	2	1	2.51	8.45		BA208125000	125	165.0	40.0	248	124

FV PP-R/PP-RCT tee reduced

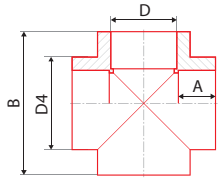
System: **AQUA**
Material: PP-R/PP-RCT
Standard: ČSN EN ISO 15874
Note: Shaped fitting for branch distribution with minimal pressure loss.



						#	#	D1 [mm]	D2 [mm]	D3 [mm]	B [mm]	C [mm]
20 × 16 × 20	pcs	100	10	0.03	0.10	AA212020016	BA212020016	20	16	20	52.2	27.4
20 × 25 × 20	pcs	100	20	0.03	0.24	AA212020025	BA212020025	20	25	20	64.0	27.0
25 × 20 × 25	pcs	120	20	0.04	0.24	AA212025020	BA212025020	25	20	25	58.5	31.6
25 × 20 × 20	pcs	50	10	0.05	0.24	AA212025021	BA212025021	25	20	20	58.8	31.6
32 × 20 × 32	pcs	90	10	0.07	0.38	AA212032020	BA212032020	32	20	32	61.4	31.5
32 × 25 × 32	pcs	80	10	0.07	0.38	AA212032025	BA212032025	32	25	32	69.1	36.0
40 × 20 × 40	pcs	60	10	0.09	0.46	AA212040020	BA212040020	40	20	40	64.0	38.1
40 × 25 × 40	pcs	50	10	0.13	0.64	AA212040025	BA212040025	40	25	40	73.5	39.6
40 × 32 × 40	pcs	50	10	0.13	0.64	AA212040032	BA212040032	40	32	40	79.3	42.4
50 × 25 × 50	pcs	40	4	0.147	0.81	AA212050025	BA212050025	50	25	50	78.4	49.7
50 × 32 × 50	pcs	30	2	0.167	0.82	AA212050032	BA212050032	50	32	50	82.6	45.9
50 × 40 × 50	pcs	14	2	0.164	0.54	AA212050040	BA212050040	50	40	50	90.3	47.7
63 × 32 × 63	pcs	10	2	0.24	1.61	AA212063032	BA212063032	63	32	63	94.7	52.3
63 × 40 × 63	pcs	10	2	0.272	1.8	AA212063040	BA212063040	63	40	63	98.7	53.9
63 × 50 × 63	pcs	10	2	0.32	1.8	AA212063050	BA212063050	63	50	63	107.3	56.8
90 × 63 × 90	pcs	5	1	0.77	4.80	AA212090063	BA212090063	90	63	90	132.9	73.4
90 × 75 × 90	pcs	5	1	0.85	4.80	AA212090075	BA212090075	90	75	90	142.6	76.4

FV PP-R cross piece

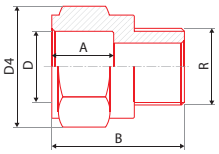
System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874
Note: Shaped fitting for branch distribution with minimal pressure loss.



						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]
20	pcs	100	10	0.03	0.16	AA235020000	BA235020000	20	31	14.5	51.0
25	pcs	100	10	0.04	0.24	AA235025000	BA235025000	25	38	16.0	59.2
32	pcs	50	10	0.06	0.34	AA235032000	BA235032000	32	42	18.0	64.0

FV PP-R reducing sleeve with plastic male thread

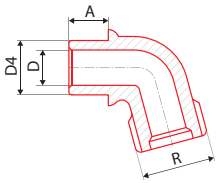
System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874
Note: Shaped fitting designed for temporary threaded connections.



						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]	G
20 × 1/2"	pcs	300	20	0.01	0.03	AA213020012	BA213020012	20	30.8	14.5	34.5	1/2"
20 × 3/4"	pcs	100	20	0.02	0.04	AA213020034	BA213020034	20	36.4	14.5	44.5	3/4"
25 × 3/4"	pcs	100	20	0.02	0.05	AA213025034	BA213025034	25	40.5	16.0	45.0	3/4"
32 × 1"	pcs	100	10	0.03	0.10	AA213032001	BA213032001	32	50	18.1	55.0	1"
40 × 5/4"	pcs	60	10	0.07	0.20	AA213040054	BA213040054	40	68.2	20.5	56.8	5/4"
50 × 6/4"	pcs	40	10	0.12	0.35	AA213050064	BA213050064	50	84.8	23.5	65.0	6/4"
63 × 2"	pcs	20	2	0.22	0.50	AA213063002	BA213063002	63	107	27.4	75.0	2"

FV PP-R outflow plastic elbow

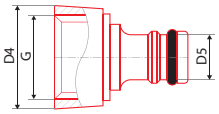
System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874
Note: Economical ending of the water supply with a threaded fitting. The shaped fitting is designed for temporary threaded connections.



						#	#	D [mm]	D4 [mm]	A [mm]	G
20 × 3/4"	pcs	150	10	0.02	0.08	AA207020034	BA207020034	20	23	14.5	3/4"
25 × 1"	pcs	100	10	0.03	0.10	AA207025001	BA207025001	25	28.5	16.0	1"

FV PP-R quick coupling

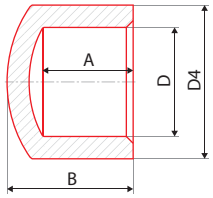
System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874
Note: Shaped fitting for connection to garden irrigation systems.



						#	#	D4 [mm]	D5 [mm]	G
20 × 3/4"	pcs	250	50	0.01	0.05	AA256020034	BA256020034	32.7	15.6	3/4"
25 × 1"	pcs	200	50	0.01	0.08	AA256025001	BA256025001	38.6	15.6	1"

FV PP-R/PP-RCT end cap

System: **AQUA**
Material: PP-R/PP-RCT
Standard: ČSN EN ISO 15874
Note: Permanent or temporary termination of a water or heating supply branch.

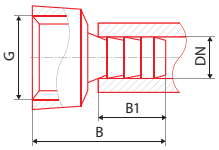


						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]
16	pcs	500	50	0.01	0.02	AA229016000	BA229016000	16	23.5	13.3	18.5
20	pcs	300	20	0.01	0.04	AA229020000	BA229020000	20	30.3	14.5	21.0
25	pcs	200	20	0.01	0.05	AA229025000	BA229025000	25	37.0	16.0	25.0
32	pcs	120	10	0.03	0.12	AA229032000	BA229032000	32	46.0	18.1	31.0
40	pcs	60	10	0.05	0.24	AA229040000	BA229040000	40	57.3	20.5	32.5
50	pcs	60	4	0.060	0.27	AA229050000	BA229050000	50	73.5	23.5	41.0
63	pcs	30	2	0.110	0.36	AA229063000	BA229063000	63	89.3	27.4	46.0
75	pcs	10	1	0.26	0.5	AA229075000	BA229075000	75	107	30	60
90	pcs	5	1	0.42	0.60	AA229090000	BA229090000	90	127	33	69
110	pcs	5	1	0.42	0.67	AA229110000	BA229110000	110	137	37	61
125	pcs	1	1	0.77	2.37		BA229125000	125	165.0	40.0	87.0

FV PP-R threaded tap connector

System: **AQUA**
Material: PP-R
Standard: –

Note: Shaped fitting for connection to garden irrigation systems. DN is the inner diameter of the hose in mm.

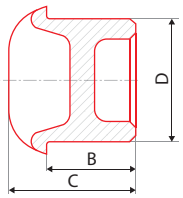


13 × 3/4"	pcs	450	50	0.01	0.05	AA280020034	BA280020034	13	43	25	3/4"
19 × 1"	pcs	225	25	0.01	0.08	AA280025001	BA280025001	19	48	27	1"

FV PP-R end cap, male

System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874

Note: Permanent or temporary termination of a water or heating supply branch.

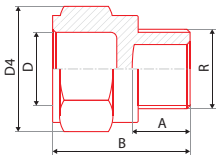


20	pcs	400	50	0.01	0.04	AA245020000	BA245020000	20	23.5	14.5
25	pcs	200	50	0.01	0.06	AA245025000	BA245025000	25	29.0	16.0

FV PP-R pressure plug, short

System: **AQUA**
Material: PP-R
Standard: ČSN EN ISO 15874

Note: Non-pressure mounting plug against mechanical dirt. The fitting is designed for temporary termination of the pipeline.

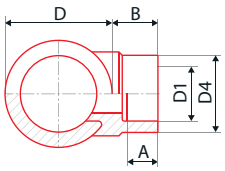


1/2"	pcs	400	50	0.01	0.04	AA253000000	BA253000000	20	30.8	14.5	34.5	1/2"

FV PP-R/PP-RCT welding saddle

System: **AQUA**
Material: PP-R/PP-RCT
Standard: ČSN EN ISO 15874

Note: Shaped fitting to allow for additional insertion of a tap. The hole diameter is drilled according to the required D1 of the tap.



63 × 32	pcs	120	10	0.036	0.150	AA238063032	BA238063032	63	32	46.0	18	27
75 × 32	pcs	120	10	0.036	0.150	AA238075032	BA238075032	75	32	46.0	18	27
90 × 32	pcs	120	10	0.036	0.150	AA238090032	BA238090032	90	32	46.0	18	27
110 × 32	pcs	120	10	0.036	0.150	AA238110032	BA238110032	110	32	46.0	18	25.7
110 × 40	pcs	1	1	0.042	0.107	AA238110040	BA238110040	110	40	57.2	20.5	27
125 × 20	pcs	1	1	0.025	0.040		BA238125020	125	20	28.3	14.5	29
125 × 25	pcs	1	1	0.025	0.040		BA238125025	125	25	37.5	16	29
125 × 32	pcs	1	1	0.035	0.092		BA238125032	125	32	46.0	18	35
125 × 40	pcs	1	1	0.083	0.150		BA238125040	125	40	57.2	20.5	38
125 × 50	pcs	1	1	0.098	1.189		BA238125050	125	50	67.0	23.5	39
125 × 63	pcs	1	1	0.163	0.312		BA238125063	125	63	93.0	27	45

FV PP pressure plug, long

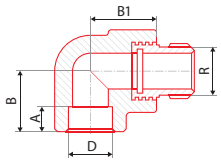
System: **AQUA**
Material: PP
Standard: –
Note: Temporary closure of threaded valves in water or heating distribution.

1/2"	pcs	120	10	0.02	0.14	AA252000001	AA252000002

FV PP-RCT COMBINED FITTINGS

FV PP-R elbow 90° with metal male thread

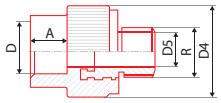
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass threaded connections and fittings.



16 × 1/2"	pcs	120	10	0.07	0.16	AA216016012	BM216016012	16	22	25	13.5	1/2"
20 × 1/2"	pcs	70	10	0.09	0.16	AA216020012	BM216020012	20	27	32	14.5	1/2"
20 × 3/4"	pcs	50	10	0.14	0.32	AA216020034	BM216020034	20	27	35	14.5	3/4"
25 × 1/2"	pcs	60	10	0.13	0.32	AA216025012	BM216025012	25	40	41	16.0	1/2"
25 × 3/4"	pcs	40	10	0.15	0.32	AA216025034	BM216025034	25	40	41	16.0	3/4"
32 × 1"	pcs	40	5	0.22	0.60	AA216032001	BM216032001	32	44	48	18.0	1"

FV PP-R reducing sleeve with metal male thread

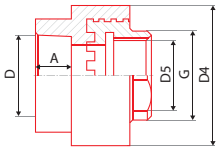
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass threaded connections and fittings.



16 × 1/2"	pcs	100	10	0.09	0.10	AA215016012	BA215016012	16	36.0	32.3	13.3	1/2"
20 × 1/2"	pcs	100	10	0.08	0.10	AA215020012	BM215020012	20	34.3	29.9	14.5	1/2"
20 × 3/4"	pcs	70	10	0.14	0.16	AA215020034	BM215020034	20	41.3	29.4	14.5	3/4"
25 × 1/2"	pcs	80	10	0.10	0.15	AA215025012	BM215025012	25	35.2	35.5	16.0	1/2"
25 × 3/4"	pcs	60	10	0.14	0.16	AA215025034	BM215025034	25	42.4	36.2	16.0	3/4"
32 × 1"	pcs	80	10	0.19	0.27	AA215032001	BM215032001	32	50.6	46.3	18.1	1"
40 × 5/4"	pcs	40	4	0.31	0.46	AA215040054	BM215040054	40	66.8	59.2	20.5	5/4"
50 × 6/4"	pcs	20	4	0.34	0.69	AA215050064	BM215050064	50	67.4	74.5	23.5	6/4"
63 × 2"	pcs	12	1	0.73	1.37	AA215063002	BM215063002	63	85.8	92.0	27.4	2"
75 × 2.5"	pcs	9	1	1.11	2.74	AA215075025	BM215075025	75	106.0	106.8	31.0	2.5"
90 × 3"	pcs	6	1	1.64	3.20	AA215090003	BM215090003	90	123.0	126.0	35.5	3"

FV PP-R/PP-RCT reducing sleeve with metal female thread

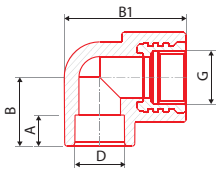
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass threaded connections and fittings.



								D [mm]	D4 [mm]	D5 [mm]	A [mm]	G
16 × 1/2"	pcs	100	10	0.06	0.10	AA217016012	BM217016012	16	39.2	32.2	13.3	1/2"
20 × 1/2"	pcs	100	10	0.06	0.10	AA217020012	BM217020012	20	40.0	30.0	14.5	1/2"
20 × 3/4"	pcs	70	10	0.11	0.16	AA217020034	BM217020034	20	45.5	29.3	14.5	3/4"
25 × 1/2"	pcs	100	10	0.06	0.16	AA217025012	BM217025012	20	39.5	36.0	16.0	1/2"
25 × 3/4"	pcs	40	10	0.10	0.16	AA217025034	BM217025034	25	45.4	36.0	16.0	3/4"
32 × 1"	pcs	60	10	0.18	0.27	AA217032001	BM217032001	32	57.5	46.5	18.1	1"
40 × 5/4"	pcs	25	5	0.31	0.46	AA217040054	BM217040054	40	76.8	60.3	20.5	5/4"
50 × 6/4"	pcs	20	2	0.37	0.69	AA217050064	BM217050064	50	82.7	74.3	23.5	6/4"
63 × 2"	pcs	10	1	0.66	1.37	AA217063002	BM217063002	63	107	97	27.4	2"

FV PP-R elbow with metal female thread

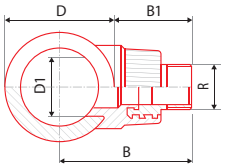
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass threaded connections and fittings.



								D [mm]	B [mm]	B1 [mm]	A [mm]	G
16 × 1/2"	pcs	150	10	0.07	0.16	AA218016012	BA218016012	16	22.0	25.0	13.5	1/2"
20 × 1/2"	pcs	80	10	0.06	0.16	AA218020012	BA218020012	20	27.0	32.0	14.5	1/2"
20 × 3/4"	pcs	50	10	0.13	0.32	AA218020034	BA218020034	20	40.0	41.0	14.5	3/4"
25 × 1/2"	pcs	60	10	0.10	0.32	AA218025012	BA218025012	25	40.0	41.0	16.0	1/2"
25 × 3/4"	pcs	50	10	0.12	0.32	AA218025034	BA218025034	25	40.0	41.0	16.0	3/4"
32 × 1"	pcs	40	5	0.20	0.60	AA218032001	BA218032001	32	44.0	48.0	18.0	1"

FV PP-R welding saddle with metal male thread

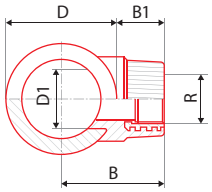
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Shaped fitting to allow additional insertion of a tap for faucets.



								D [mm]	D1 [mm]	B [mm]	B1 [mm]	G
63 × 3/4"	pcs	120	10	0.112	0.17	AA248063032	BM248063032	63	32	76.3	44.8	3/4"
75 × 3/4"	pcs	120	10	0.117	0.17	AA248075032	BM248075032	75	32	82.3	44.8	3/4"
90 × 3/4"	pcs	120	10	0.112	0.17	AA248090032	BM248090032	90	32	89.8	44.8	3/4"
125 × 40 × 1"	pcs	1	1	0.234	0.168		BM248125040	75–125	40	91.5–116.5	54	1"
125 × 50 × 5/4"	pcs	1	1	0.342	0.227		BM248125050	90–125	50	104–121.5	59	5/4"
125 × 50 × 6/4"	pcs	1	1	0.350	0.227		BM248125051	90–125	50	104–21.5	59	6/4"
125 × 63 × 2"	pcs	1	1	0.632	0.227		BM248125063	110–125	63	95–102.5	40	2"

FV PP-R welding saddle with metal female thread

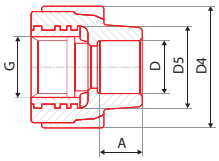
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Shaped fitting to allow additional insertion of a tap for faucets.



						#	#	D [mm]	D1 [mm]	B [mm]	B1 [mm]	G
63 × 3/4"	pcs	120	10	0.091	0.17	AA247063032	BM247063032	63	32	58.5	27	3/4"
75 × 3/4"	pcs	120	10	0.091	0.17	AA247075032	BM247075032	75	32	64.5	27	3/4"
90 × 3/4"	pcs	120	10	0.091	0.17	AA247090032	BM247090032	90	32	72.0	27	3/4"
125 × 25 × 1/2"	pcs	1	1	0.058	0.03		BM247125025	63–125	25	60.5–91.5	29	1/2"
125 × 32 × 3/4"	pcs	1	1	0.102	0.07		BM247125032	63–125	32	66.5–97.5	35	3/4"
125 × 40 × 1"	pcs	1	1	0.194	0.12		BM247125040	75–125	40	75.5–100.5	38	1"
125 × 40 × 5/4"	pcs	1	1	0.194	0.12		BM247125041	75–125	40	75.5–100.5	38	1 1/4"
125 × 50 × 5/4"	pcs	1	1	0.240	0.15		BM247125050	90–125	50	84–101.5	39	1 1/4"
125 × 50 × 6/4"	pcs	1	1	0.244	0.15		BM247125051	90–125	50	84–101.5	39	1 1/2"
125 × 63 × 2"	pcs	1	1	0.490	0.26		BM247125063	110–125	63	100–107.5	45	2"

FV PP-R reducing sleeve with metal female thread with cross

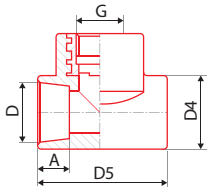
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Shaped fitting to allow additional insertion of a tap for faucets.



						#	#	D [mm]	D4 [mm]	D5 [mm]	A [mm]	G
20 × 1/2" kříž	pcs	100	10	0.06	0.11	AA217022012	BM217022012	20	38	28.1	14.5	1/2"

FV PP-R tee with metal female thread

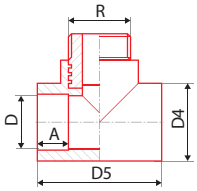
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Allows branching of a part to brass threaded connections and fittings.



						#	#	D [mm]	D4 [mm]	D5 [mm]	A [mm]	G
20 × 1/2"	pcs	60	10	0.07	0.19	AA222020012	BM222020012	20	29.0	37.0	14.5	1/2"
25 × 1/2"	pcs	40	10	0.08	0.24	AA222025012	BM222025012	25	36.0	37.0	16.0	1/2"
25 × 3/4"	pcs	30	10	0.13	0.32	AA222025034	BM222025034	25	38.4	46.5	16.0	3/4"
32 × 1"	pcs	40	5	0.22	0.60	AA222032001	BM222032001	32	48.4	58.0	18.1	1"

FV PP-R tee with metal male thread

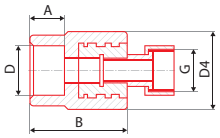
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Allows branching of a part to brass threaded connections and fittings.



						#	#	D [mm]	D4 [mm]	D5 [mm]	A [mm]	G
20 × 1/2"	pcs	100	10	0.09	0.19	AA254020012	BM254020012	20	29.2	36.8	14.5	1/2"
25 × 1/2"	pcs	40	10	0.10	0.24	AA254025012	BM254025012	25	37.0	41.0	16.0	1/2"
25 × 3/4"	pcs	30	10	0.17	0.32	AA254025034	BM254025034	32	37.0	41.0	16.0	3/4"

FV PP-R reducing sleeve with metal thread and union nut (PM injection)

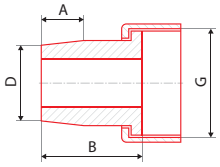
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass removable connections.



								D [mm]	D4 [mm]	A [mm]	B [mm]	G
16 × 1/2"	pcs	120	10	0.05	0.05	AA223016012	BA223016012	16	37	13.3	33.6	1/2"
16 × 3/4"	pcs	100	10	0.08	0.06	AA223016034	BA223016034	16	37	13.3	37.0	3/4"
20 × 1"	pcs	50	10	0.23	0.06	AA223020001	BA223020001	20	43	14.5	43.0	1"
20 × 1/2"	pcs	120	10	0.05	0.05	AA223020012	BA223020012	20	37	14.5	33.6	1/2"
20 × 3/4"	pcs	100	10	0.08	0.06	AA223020034	BA223020034	20	37	14.5	37.0	3/4"
25 × 1"	pcs	40	10	0.26	0.07	AA223025001	BA223025001	25	43	16.0	44.0	1"
25 × 3/4"	pcs	100	10	0.26	0.06	AA223025034	BA223025034	25	37	16.0	39.0	3/4"
32 × 5/4"	pcs	25	5	0.36	0.12	AA223032054	BA223032054	32	52	18.1	47.5	5/4"

FV PP-R socket with union nut

System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass removable connections. |* with hole for sealing.

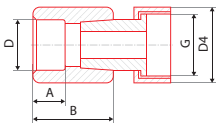


								D [mm]	A [mm]	B [mm]	G
20 × 3/4"	pcs	150	50	0.04	0.05	AA225020034	BM225020034	20	14.5	35.5	3/4"
20 × 3/4"	pcs	150	50	0.04	0.05	AA225020134 [1)]	BA225020134 [1)]	20	14.8	35.5	3/4"
25 × 1"	pcs	80	20	0.07	0.10	AA225025001	BM225025001	25	16.0	45.2	1"
32 × 5/4"	pcs	45	15	0.10	0.18	AA225032054	BM225032054	32	18.0	45.3	5/4"
40 × 6/4"	pcs	40	1	0.16	0.22	AA225040064	BM225040064	40	20.5	51.5	6/4"
50 × 2"	pcs	20	1	0.30	0.41	AA225050002	BM225050002	50	23.5	60.5	2"

[1)] with a hole for seal

FV PP-R plastic reducing sleeve with union nut

System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass removable connections. |* with hole for sealing.

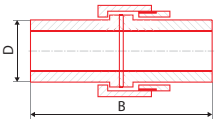


								D [mm]	D4 [mm]	A [mm]	B [mm]	G
16 × 3/4"	pcs	220	20	0.05	0.16	AA226016034	BM226016034	16	29.2	13.0	33.1	3/4"
20 × 1/2"	pcs	300	25	0.04	0.16	AA226020012	BM226020012	20	29.2	14.5	34.0	1/2"
20 × 3/4"	pcs	200	20	0.05	0.16	AA226020034	BM226020034	20	28.6	14.5	32.4	3/4"
20 × 3/4"	pcs	200	20	0.05	0.16	AA226020134 [1)]	BM226020134 [1)]	20	28.6	14.5	32.0	3/4"
25 × 1"	pcs	120	10	0.09	0.19	AA226025001	BM226025001	25	36.7	16.0	35.0	1"
25 × 3/4"	pcs	150	10	0.05	0.19	AA226025034	BM226025034	25	36.8	16.0	34.4	3/4"
25 × 3/4"	pcs	150	10	0.05	0.19	AA226025134 [1)]	BM226025134 [1)]	32	36.8	16.0	34.0	3/4"
32 × 1"	pcs	100	10	0.10	0.48	AA226032001	BM226032001	32	47.0	18.0	38.0	1"

[1)] with a hole for seal

FV PP-R detachable pipe-to-pipe connection

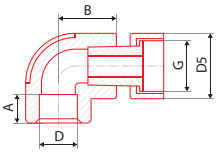
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass removable connections.



						#	#	D [mm]	B [mm]
20	pcs	200	10	0.08	0.15	AA224020000	BA224025000	20	73
25	pcs	120	5	0.12	0.20	AA224025000	BA224025000	25	93.5
32	pcs	70	5	0.19	0.25	AA224032000	BA224032000	32	93.5
40	pcs	50	5	0.27	0.35	AA224040000	BA224040000	40	105.0
50	pcs	25	5	0.49	0.65	AA224050000	BA224050000	50	123.0

FV PP-R elbow 90° elbow with union nut

System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass removable connections. |* with hole for sealing.

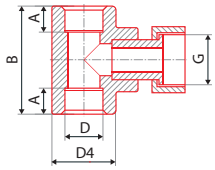


						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]	G
20 × 1/2"	pcs	250	25	0.04	0.02	AA227020012	BA227020012	20	29.0	14.5	29.3	1/2"
20 × 3/4"	pcs	180	20	0.06	0.03	AA227020034	BA227020034	25	30.0	14.5	25.5	3/4"
20 × 3/4"	pcs	180	20	0.06	0.02	AA227020134 [1]	BA227020134 [1]	20	30.0	14.5	25.5	3/4"
25 × 3/4"	pcs	120	10	0.06	0.10	AA227025034	BA227025034	32	36.6	16.0	32.0	3/4"

[1] with a hole for seal

FV PP-R tee plastic reducing sleeve with union nut

System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass removable connections.

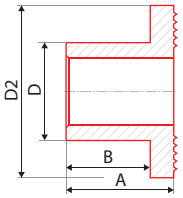


						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]	G
20 × 3/4" × 20	pcs	130	10	0.07	0.24	AA228020034	BM228020034	20	29.0	14.5	51.0	3/4"
20 × 3/4" × 20	pcs	120	20	0.07	0.24	AA228020134 [1]	BM228020134 [1]	20	29.0	14.5	51.0	3/4"
25 × 3/4" × 25	pcs	80	10	0.08	0.32	AA228025034	BM228025034	25	36.6	16.0	58.0	3/4"
25 × 3/4" × 25	pcs	80	10	0.08	0.32	AA228025134 [1]	BM228025134 [1]	25	36.6	16.0	58.0	3/4"
32 × 3/4" × 32	pcs	60	10	0.11	0.38	AA228032034	BM228032034	32	46.0	18.1	61.4	3/4"
32 × 1" × 32	pcs	50	10	0.13	0.38	AA228032044	BM228032044	32	45.6	18.1	69	1"

[1] with a hole for seal

FV PP-R flange adaptor

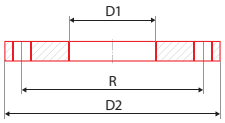
System: **AQUA**
Material: PP-R
Standard: –
Note: Transition from welded distribution to flanged connections.



						#	#	D [mm]	DN [mm]	D2 [mm]	A [mm]	B [mm]
40/32	pcs	40	4	0.07	0.35	AA230040032	BA230040032	40	32	78	50	38
50/40	pcs	40	2	0.10	0.55	AA230050040	BA230050040	50	40	98	55	43
63/50	pcs	20	2	0.15	0.67	AA230063050	BA230063050	60	50	112	60	46.5
75/65	pcs	15	1	0.26	1.20	AA230075065	BA230075065	75	65	122	66	50
90/80	pcs	10	1	0.37	1.35	AA230090080	BA230090080	90	80	135	85	63
110/100	pcs	5	1	0.62	2.45	AA230110100	BA230110100	110	100	163	100	82
125/100	pcs	1	1	0.36	2.34		BA230125100	125	100	162	53	40
125/125	pcs	1	1	1.34	5.38		BA230125125	125	125	188	185	145

FV PP-R FE flange

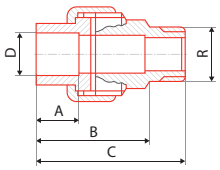
System: **AQUA**
Material: steel
Standard: –
Note: Transition from welded distribution to flanged connections.



						#	D1 [mm]	D2 [mm]	R [mm]	d	number of holes
40/32	pcs	1	1	1.42	0.35	AA231040032	43	140	100	M 16	4
50/40	pcs	1	1	1.82	0.38	AA231050040	53	150	110	M 16	4
63/50	pcs	1	1	2.23	0.45	AA231063050	66	165	125	M 16	4
75/65	pcs	1	1	2.48	0.55	AA231075065	78	185	145	M 16	4
90/80	pcs	1	1	3.25	0.80	AA231090080	95	200	160	M 16	8
110/100	pcs	1	1	3.60	0.97	AA231110100	114	220	180	M 16	8
125/100	pcs	1	1	1.078	0.68	AA231125100	149	220	180	M 16	8
125/125	pcs	1	1	1.844	1.18	AA231125125	158	250	210	M 16	8

FV PP-R transition union male

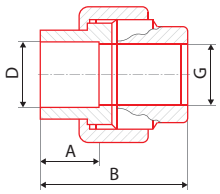
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass removable connections.



						#	#	D [mm]	A [mm]	B [mm]	C [mm]	G
20 × 1/2"	pcs	125	1	0.11	0.09	AA237020012	BM237020012	20	14.5	41	53	1/2"
25 × 3/4"	pcs	65	1	0.19	0.17	AA237025034	BM237025034	25	16.0	44	59	3/4"
32 × 1"	pcs	50	1	0.25	0.22	AA237032001	BM237032001	32	18.1	46	63	1"
40 × 5/4"	pcs	25	1	0.36	0.44	AA237040054	BM237040054	40	20.5	51	68	5/4"
50 × 6/4"	pcs	20	1	0.59	0.55	AA237050064	BM237050064	50	23.5	52	70	6/4"
63 × 2"	pcs	8	1	1.03	1.37	AA237063002	BA237063002	63	27.4	64	90	2"

FV PP-R transition union female

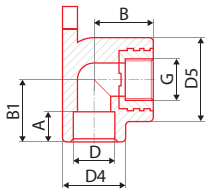
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Transition from welded parts to brass removable connections.



						#	#	D [mm]	A [mm]	B [mm]	G
20 × 1/2"	pcs	150	1	0.10	0.07	AA236020012	BM236020012	20	14.5	41	1/2"
25 × 3/4"	pcs	75	1	0.16	0.15	AA236025034	BM236025034	25	16.0	44	3/4"
32 × 1"	pcs	50	1	0.19	0.22	AA236032001	BA236032001	32	18.1	46	1"
32 × 5/4"	pcs	50	1	0.29	0.36	AA236032054	BM236032054	32	18.1	51	5/4"
40 × 5/4"	pcs	30	1	0.32	0.36	AA236040054	BM236040054	40	20.5	51	5/4"
50 × 6/4"	pcs	25	1	0.48	0.55	AA236050064	BM236050064	50	23.5	52	6/4"
63 × 2"	pcs	8	1	0.82	1.37	AA236063002	BM236063002	63	27.4	64	2"

FV PP-R wall-mounted elbow with metal female thread

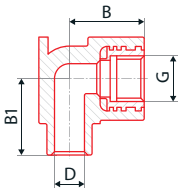
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Shaped fitting for installation of faucet fittings – valves, taps, etc.



						#	#	D [mm]	D5 [mm]	D4 [mm]	B [mm]	G
16 × 1/2"	pcs	50	10	0.07	0.22	AA219016012	BA219016012	16	38.6	28.2	35.0	1/2"
20 × 1/2"	pcs	100	10	0.07	0.36	AA219020012	BA219020012	20	39.6	30.2	34.3	1/2"
25 × 1/2"	pcs	30	10	0.12	0.55	AA219025012	BA219025012	25	46.4	37.2	40.0	1/2"
25 × 3/4"	pcs	30	10	0.13	1.37	AA219025034	BA219025034	25	46.4	37.2	40.0	3/4"

FV PP-R wall-mounted elbow with metal female thread with pin

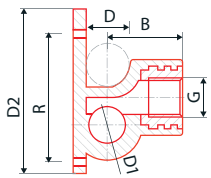
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Shaped fitting for installation of faucet fittings – valves, taps, etc.



								D [mm]	B [mm]	B1 [mm]	C [mm]	G
20 × 1/2"	pcs	100	10	0.06	0.21	AA239020012	BM239020012	20	35	35	11	1/2"

FV PP-R wall-mounted elbow with metal female thread, left and right

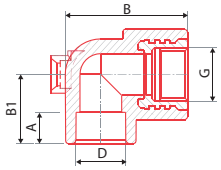
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Shaped fitting for installation of faucet fittings – valves, taps, etc.



						#	#	D [mm]	D2 [mm]	R [mm]	B [mm]	G
20 × 1/2"	pcs	100	10	0.078	0.22	AA219020013	LEVÉ	20	74	62.1	34.0	1/2"
20 × 1/2"	pcs	100	10	0.078	0.22	AA219020014	PRAVÉ	20	74	62.1	34.3	1/2"

FV PP-R elbow with metal female thread UNI

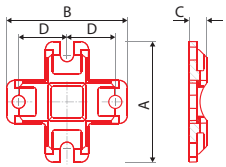
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Shaped fitting for installation of faucet fittings – valves, taps, etc.



						#	#	D [mm]	B [mm]	B1 [mm]	A [mm]	G
20 × 1/2"	pcs	120	10	0.06	0.15	AA258020012	BM258020012	20	54.0	27	14.5	1/2"

FV PP-R MONO holder for UNI elbow

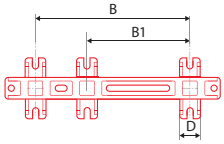
System: **AQUA**
Material: PP-R
Standard: –
Note: Shaped fitting for installation of faucet fittings – valves, taps, etc.



						#	D [mm]	A [mm]	C [mm]	B [mm]
20 × 1/2"	pcs	200	10	0.008	0.036	AA258800000	24	60	8.9	60

FV PP-R DUO holder for UNI elbow

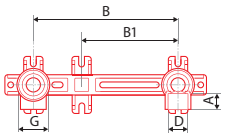
System: **AQUA**
Material: PP-R
Standard: –
Note: Shaped fitting for installation of faucet fittings – valves, taps, etc.



						#	D [mm]	B [mm]	B1 [mm]
20 × 1/2"	pcs	120	10	0.029	0.18	AA258900000	20	150	100

FV PP-R double wall-mounted elbow with adjustable spacing

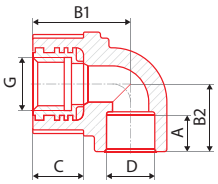
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Tap water connectors with adjustable distance of 100 or 150 mm.



						#	#	D [mm]	A [mm]	B [mm]	B1 [mm]	G
20 × 1/2"	pcs	30	5	0.163	0.60	AA255020012	BA255020012	20	15	150	100	1/2"

FV PP-R elbow for plasterboard wall mounting

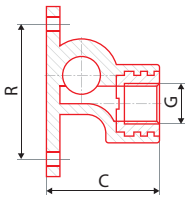
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: For fitting faucet fittings into plasterboard.



						#	#	D [mm]	A [mm]	B1, B2 [mm]	C [mm]	G
20 × 1/2"	pcs	50	1	0.13	1.02	AA240020012	BA240020012	20	15	42, 27	25	1/2"

FV PP-R/PP-RCT wall-mounted tee (through-wall bracket)

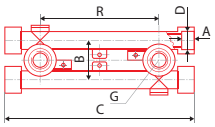
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Allows multiple faucet fittings to be fitted on one route.



						#	#	D [mm]	A [mm]	C [mm]	R [mm]	G
20 × 1/2"	pcs	60	10	0.08	0.21	AA220020012	BA220020012	20	14.5	50	61.5	1/2"
25 × 1/2"	pcs	50	10	0.09	0.36	AA220025012T	BM220025012	25	16.0	56	75.0	1/2"

FV PP-RCT double wall-mounted set

System: **AQUA**
Material:
Standard: –
Note: Shaped fitting suitable for installation of mixer faucets. Adjustable for exact spacing R = 100, 113, 137 and 150 mm.

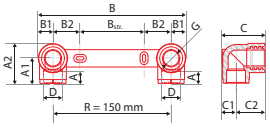


						#	#	D [mm]	A [mm]	B [mm]	C [mm]	G
2 × 20 × 1/2"	pcs	15	1	0.20	1.37	AA221020012	BM221020012	20	14.5	46	222	1/2"
2 × 25 × 1/2"	pcs	10	1	0.31	1.32	AA221025012 [1]	BA221025012 [1]	25	16.0	51	230	1/2"

[1] Set pitch 100/135/150 mm, need to be balance with an eccentric tray.

FV PP-R double wall-mounted elbow (150)

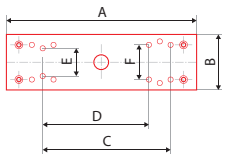
System: **AQUA**
Material:
Standard: ČSN EN 15874, DIN 8077, DIN 8078
Note: The fitting is suitable for fitting mixer taps. Robust double wall elbow with fixed spacing R = 150 mm.



						#	#	D [mm] outer Ø of the pipe	Min. depth of insertion into the throat	A1 [mm]	A2 [mm]	B [mm]	B1 [mm]	Bstr. [mm]	C [mm]	C1 [mm]	C2 [mm]	G
20 × 1/2"	pcs	36	1	0.165	0.518	AA249020012	BM249020012	20	14.5	32	51.5	189	19.5	80	50	14	36	1/2"
25 × 1/2"	pcs	36	1	0.179	0.518	AA249025012	BM249025012	25	16	32	51.5	189	19.5	80	53.5	17.5	36	1/2"

FV PP-R wall mount for elbow

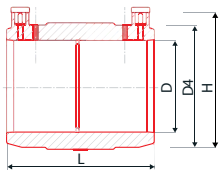
System: **AQUA**
Material: PP-R
Standard: –
Note: Practical accessory for easy installation in dry building systems.



						#	A [mm]	B [mm]	C [mm]	D [mm]	E, F [mm]
	pcs	60	1	0.08	0.15	AA251000001	220	64	135	110	40.45

FV PP-R electrical coupling

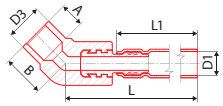
System: **AQUA**
Material: PP-R
Standard: –
Note: For welding larger pipe sizes and difficult to access routes.



						#	#	D [mm]	A [mm]	L [mm]
20	pcs	1	1	0.04	0.3	AA234020000	BA234020000	20	26.5	55
25	pcs	1	1	0.075	0.438	AA234025000	BA234025000	25	26.5	55
32	pcs	1	1	0.097	0.500	AA234032000	BA234032000	32	25.0	52
40	pcs	1	1	0.127	0.538	AA234040000	BA234040000	40	25.0	52
50	pcs	1	1	0.210	0.875	AA234050000	BA234050000	50	25.5	52
63	pcs	1	1	0.320	1.400	AA234063000	BA234063000	63	30.0	63
75	pcs	1	1	0.487	1.750	AA234075000	BA234075000	75	33.0	70
90	pcs	1	1	0.565	1.97	AA234090000	BA234090000	90	36.0	75
110	pcs	1	1	0.8	2.57	AA234110001	BA234110000	110	40.0	87

FV PP-R joining elbow 45° to radiator

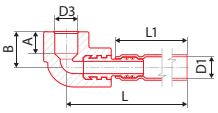
System: **COMFORT**
Material:
Standard: ČSN EN ISO 15877
Note: For connection of compact radiators with clamp fitting.



						#	A [mm]	B [mm]	D1, D3 [mm]	L [mm]	L1 [mm]
20	pcs	20	1	0.126		AA244020270	14.5	24	15, 20	300	270
20	pcs	10	1	0.273		AA244020720	14.5	24	15, 20	750	720

FV PP-R joining elbow 90° to radiator

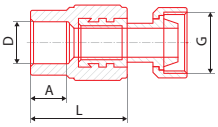
System: **COMFORT**
Material:
Standard: ČSN EN ISO 15874
Note: For connection of compact radiators with clamp fitting.



						#	A [mm]	B [mm]	D1, D3 [mm]	L [mm]	L1 [mm]
20	pcs	20	1	0.123		AA243020270	13	22.5	15, 20	298	270

FV PP-R Eurocone sleeve with metal thread

System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: For easy connection of radiators and other heating elements.

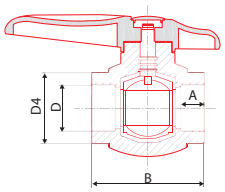


						#	D [mm]	A [mm]	G	L [mm]
20 × 3/4"	pcs	100	10	0.091	0.154	AA257020034	20	14.5	3/4"	40

SHUT-OFF VALVES

FV PP-R plastic ball valve with butterfly / FV PP-R plastic ball valve with lever

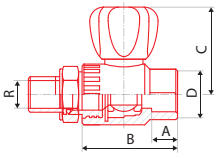
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Ball valve with chrome ball and Teflon seats.



									D [mm]	D4 [mm]	A [mm]	B [mm]
16	pcs	40	10	0.12	0.17	AA271016000	BA271016000	s motýlkem	16	22.8	13.0	58.6
20	pcs	40	10	0.12	0.34	AA271020000	BA271020000	s motýlkem	20	31.2	14.5	61.1
20	pcs	40	10	0.12	0.34	AA271020100	BA271020100	s páčkou	20	31.2	14.5	61.1
25	pcs	40	4	0.21	0.69	AA271025000	BA271025000	s páčkou	25	37.4	16.0	74.5
32	pcs	20	2	0.36	0.69	AA271032000	BA271032000	s páčkou	32	48.5	18.0	85.0
40	pcs	15	1	0.36	1.60	AA271040000	BA271040000	s páčkou	40	60.4	20.5	98.0
50	pcs	9	1	0.65	1.60	AA271050000	BA271050000	s páčkou	50	75.5	23.5	116.3
63	pcs	6	1	1.12	4.80	AA271063000	BA271063000	s páčkou	63	92.5	27.5	131.0
75	pcs	4	1	1.83	4.80	AA271075000	BA271075000	s páčkou	75	108.0	30.0	165.0

FV PP-R radiator ball valve, straight

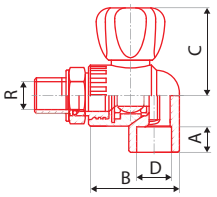
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Ball valve with chrome ball and Teflon seats. Designed for long life and reliable functionality.



						#	D [mm]	D4 [mm]	A [mm]	B [mm]	C [mm]
20 × 1/2"	pcs	60	1	0.154	0.12	AA289020012	20	29	16.1	55.1	52
25 × 3/4"	pcs	40	1	0.198	0.16	AA289025034	25	36.5	17.1	60.2	56

FV PP-R radiator ball valve, elbow

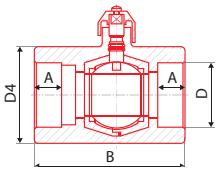
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Ball valve with chrome ball and Teflon seats. Designed for long life and reliable functionality.



						#	D [mm]	D4 [mm]	A [mm]	B [mm]	C [mm]
20 × 1/2"	pcs	50	1	0.160	0.13	AA290020012	20	29	15.1	51	52
25 × 3/4"	pcs	40	1	0.198	0.18	AA290025034	25	36.5	17.1	60.5	56

FV PP-R plastic ball valve with PV valve

System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Ball valve with chrome ball and Teflon seats. With release drain.

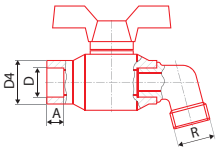


						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]
20	pcs	60	10	0.14	0.37	AA272020000	BA272020000	20	31.4	14.5	74.5
25	pcs	60	10	0.14	0.40	AA272025000	BA272025000	25	38.2	16.0	78.5
32	pcs	30	2	0.24	0.80	AA272032000	BA272032000	32	49.0	18.0	91.0
40	pcs	20	2	0.38	1.60	AA272040000	BA272040000	40	60.0	20.5	105.0
50	pcs	14	1	0.66	1.60	AA272050000	BA272063000	50	76.0	23.5	121.5
63	pcs	8	1	1.14	4.80	AA272063000	BA272063000	63	94.0	27.5	144.0
75	pcs	5	1	1.85	4.80	AA272075000	BA272075000	75	108.0	30.0	165.0

* The hexagonal valve at the valve body is a structural element that serves to fix and prevent overturning when releasing the valve. Don't rotate the hexagon under any circumstances To open the drain valve, there is a loosening screw with notches around the circumference, which is operated manually. The valve opens counterclockwise and closes clockwise.

FV PP-R plastic garden ball valve with elbow outlet

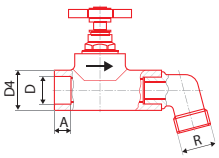
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Ball valve with chrome ball and Teflon seats.



						#	D [mm]	D4 [mm]	A [mm]	B [mm]	G
20	pcs	40	1	0.14	0.39	AA273020000	20	31.2	14.5	96	3/4"
25	pcs	30	1	0.15	0.77	AA273025000	25	37.4	16.0	117	1"

FV PP-R valve with threaded elbow for hose connection

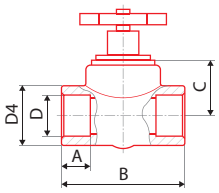
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Valve with a practical spigot allows the flow of water to be regulated, e.g. to a garden system.



						#	D [mm]	D4 [mm]	A [mm]	B [mm]	G
20	pcs	50	10	0.17	0.65	AA276020000	20	30	14.5	112.5	3/4"
25	pcs	40	10	0.24	0.68	AA276025000	25	37.3	16.0	125	1"

FV PP-R straight-way valve, plastic

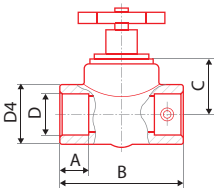
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Straight valve with high durability. Allows flow control.



						#	#	D [mm]	D4 [mm]	A [mm]	B [mm]	C [mm]
20	pcs	60	10	0.15	0.60	AA274020000	BA274020000	20	30	14.5	76.0	26
25	pcs	40	10	0.21	0.60	AA274025000	BA274025000	25	37	16.0	83.5	35
32	pcs	30	5	0.32	0.96	AA274032000Z	BA274032000	32	46	18.0	94.0	38
40	pcs	20	2	0.40	1.07	AA274040000Z	BA274040000	40	60	20.5	107.0	38
50	pcs	10	1	0.75	1.92	AA274050000	BA274050000	50	71	23.5	135.0	56
63	pcs	6	1	1.29	2.10	AA274063000	BA274063000	63	84	27.5	160.0	60

FV PP-R straight-way valve, plastic, with PV valve

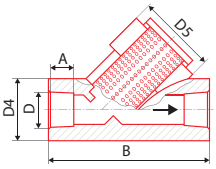
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Straight valve with high durability. Built-in drain valve.



								D [mm]	D4 [mm]	A [mm]	B [mm]	C [mm]
20	pcs	50	10	0.17	0.60	AA275020000	BA275020000	20	30	14.5	76.0	26
25	pcs	40	10	0.24	0.60	AA275025000	BA275025000	25	37	16.0	83.0	35
32	pcs	32	2	0.35	0.96	AA275032000	BA275032000	32	46	18.0	94.0	38
40	pcs	20	2	0.42	1.07	AA275040000	BA275040000	40	60	20.5	107.0	38

FV PP-R filter

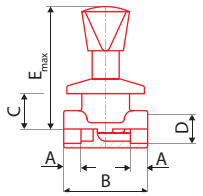
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Shaping tube with stainless steel sieve for catching coarse dirt.



								D [mm]	D4 [mm]	D5 [mm]	A [mm]	B [mm]
20	pcs	40	1	0.17	0.36	AA282020000	BA282020000	20	35.3	46.8	14.5	83.6
25	pcs	40	1	0.17	0.36	AA282025000	BA282025000	25	35.3	46.8	16.0	83.6
32	pcs	30	5	0.25	0.54	AA282032000	BA282032000	32	42.0	46.8	18.0	94.0

FV PP-R Laguna shut off valve concealed, with chrome stopcock

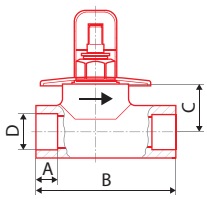
System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Elegant concealed valve for closing the branches of the distribution system.



								D, D4 [mm]	A [mm]	B [mm]	C [mm]	Emax [mm]
20	pcs	15	1	0.25		AA285020000	BA285020000	20/36	14.5	76.0	26	105
25	pcs	12	1	0.30		AA285025000	BA285025000	25/37.3	16.0	83.5	35	115

FV PP-R Laguna shut off valve concealed, with cover

System: **AQUA**
Material:
Standard: ČSN EN ISO 15874
Note: Elegant concealed valve for closing the branches of the distribution system. 20* short version (51 mm), 20L* long version (69 mm).

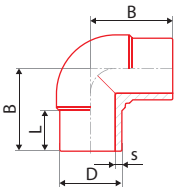


									D [mm]	A [mm]	B [mm]	C [mm]
20	pcs	20	1	0.17		AA286020000	BA286020000	metal sh.	20	15	75.6	26
25	pcs	15	1	0.21		AA286025000	BA286025000	metal sh.	25	16	83.3	36

FITTINGS FOR BUTT WELDING

FV PP-RCT butt weld elbow 90°

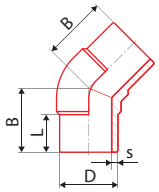
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Change of direction with minimum pressure loss, maintains pipe clearance.



						#	D [mm]	Z [mm]	L [mm]
160	pcs	2	1	3.0	9	BA202160000	160	212	110
200	pcs	1	1	5.4	20	BA202200000	200	255	127
250	pcs	3	1	9.5	30	BA202250000	250	294	140

FV PP-RCT butt weld elbow 45°

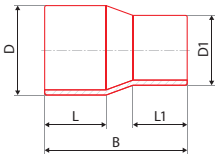
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Change of direction with minimum pressure loss, maintains pipe clearance.



						#	D [mm]	Z [mm]	L [mm]
160	pcs	2	1	2.42	7	BA203160000	160	168	110
200	pcs	2	1	4.44	16	BA203200000	200	217	127
250	pcs	2	1	7.66	25	BA203250000	250	223	140

FV PP-RCT butt weld reducer

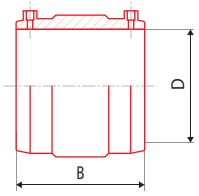
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Connecting pipes of different diameters with reduced pressure loss.



						#	D [mm]	D1 [mm]	Z [mm]	L [mm]	L1 [mm]
160 × 110	pcs	9	1	1.14	5	BA210160110	160	110	255	110	93
160 × 125	pcs	9	1	1.16	5	BA210160125	160	125	255	110	97
200 × 160	pcs	9	1	2.61	9	BA210200160	200	160	275	122	100
250 × 160	pcs	9	1	3.95	14	BA210250160	250	160	330	137	111
250 × 200	pcs	9	1	4.45	15	BA210250200	250	200	330	137	128

FV PP-RCT electro-fusion coupling

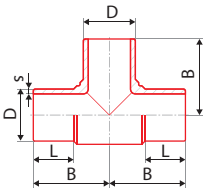
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: For welding larger pipe sizes and difficult to access routes.



						#	D [mm]	L [mm]
125	pcs	1	1	0.95	3.8	BA234125000	125	152.3
160	pcs		1	1.82	5	BA234160000	160	175
200	pcs		1	2.58	9	BA234200000	200	185
250	pcs		1	4.42	14	BA234250000	250	213

FV PP-RCT butt weld tee non-reversible

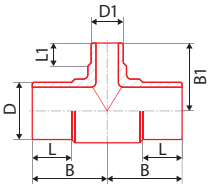
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Shaped fitting for branch distribution with minimal pressure loss.



						#	D [mm]	Z [mm]	L [mm]
160	pcs		1	3.99	12	BA208160000	160	225	124
200	pcs		1	7.38	18	BA208200000	200	251	127
250	pcs		1	9.80	23	BA208250000	250	314	148

FV PP-RCT butt weld polyfusion tee, reduced

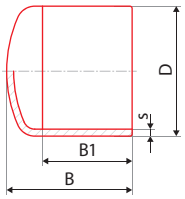
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Branching of the pipeline into different diameters with minimum pressure loss.



						#	D [mm]	D1 [mm]	Z [mm]	L [mm]	L1 [mm]
160 × 90 × 160	pcs		1	3.20	9	BA212160090	160	90	212	110	85
160 × 110 × 160	pcs		1	3.34	10	BA212160110	160	110	212	110	95
200 × 110 × 200	pcs		1	6.40	15	BA212200110	200	110	255	127	95
200 × 125 × 200	pcs		1	6.80	16	BA212200125	200	125	255	127	100
200 × 160 × 200	pcs		1	7.12	17	BA212200160	200	160	255	127	110

FV PP-RCT butt weld end cap

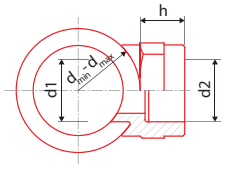
System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Permanent or temporary termination of a water or heating supply branch.



						#	D [mm]	L [mm]	L1 [mm]
160	pcs		1	0.90	2.9	BA229160000	160	140	100
200	pcs		1	2.03	6.2	BA229200000	200	190	145
250	pcs		1	3.18	12.7	BA229250000	250	218	263

FV PP-RCT welding saddle polyfusion

System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874
Note: Allows additional insertion of smaller diameter branches.

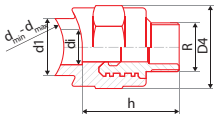


						#	d_{min} [mm]	d_{max} [mm]	D1 [mm]	D2 [mm]	H [mm]
125 × 32	pcs		1	0.04	0.4	BA238125032	75	125	32	32	35

FV PP-RCT welding saddle with metal male thread polyfusion

System: **AQUA**
Material: PP-RCT – brass
Standard: ČSN EN ISO 15874

Note: Shaped fitting to allow additional insertion of a tap for faucets.

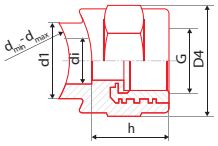


						#	d_{min} [mm]	d_{max} [mm]	[mm]	R	[mm]	di [mm]	D4 [mm]
160–250 × 25 × 1/2"	pcs	1	1	0.132	0.048	BM248160025	160	250	25	1/2"	42	15	38
160–250 × 40 × 1"	pcs	1	1	0.234	0.168	BM248160040	160	250	40	1"	54	25.5	63
160–250 × 50 × 5/4"	pcs	1	1	0.330	0.227	BM248160050	160	250	50	1 1/4"	59	32	70
160–250 × 50 × 6/4"	pcs	1	1	0.350	0.227	BM248160051	160	250	50	1 1/4"	59	34	70
160–250 × 63 × 2"	pcs	1	1	0.632	0.255	BM248160063	160	250	63	2"	45	40	85

FV PP-RCT welding saddle with metal female thread polyfusion

System: **AQUA**
Material: PP-RCT – brass
Standard: ČSN EN ISO 15874

Note: Shaped fitting to allow additional insertion of a tap for faucets.

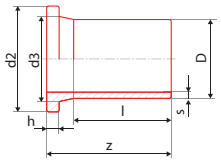


						#	d_{min} [mm]	d_{max} [mm]	[mm]	R	[mm]	di [mm]	D4 [mm]
160–250 × 25 × 1/2"	pcs	1	1	0.060	0.03	BM247160025	160	250	25	1/2"	29	15	38
160–250 × 32 × 3/4"	pcs	1	1	0.102	0.07	BM247160032	160	250	32	3/4"	35	20.5	51
160–250 × 40 × 1"	pcs	1	1	0.194	0.12	BM247160040	160	250	40	1"	38	25.5	63
160–250 × 40 × 5/4"	pcs	1	1	0.194	0.12	BM247160041	160	250	40	1 1/4"	38	25.5	63
160–250 × 50 × 5/4"	pcs	1	1	0.240	0.15	BM247160050	160	250	50	1 1/4"	39	32	70
160–250 × 50 × 6/4"	pcs	1	1	0.244	0.15	BM247160051	160	250	50	1 1/2"	39	34	70
160–250 × 63 × 2"	pcs	1	1	0.490	0.26	BM247160063	160	250	63	2"	45	40	85

FV PP-RCT butt weld flange adaptor

System: **AQUA**
Material: PP-RCT
Standard: ČSN EN ISO 15874

Note: Transition from welded distribution to flanged connections. D is the outside diameter of the plastic pipe.

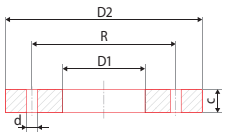


						#	D [mm]						s [mm]
160/150	pcs		1	1.2	3.8	BA230160150	160	110	175	212	175	25	14.6
200/200	pcs		1	1.89	4.7	BA230200200	200	127	205	268	232	32	18.2

FV PP-RCT plastic-plated flange

System: **AQUA**
Material: plastic coated steel
Standard: –

Note: Transition from welded distribution to flanged connections.



						#	D1 [mm]	D2 [mm]	R [mm]	d	number of holes
160/150	pcs		1	2.804	1.53	BA231160150	178	285	240	M16	8
200/200	pcs		1	3.77	2.18	BA231200200	235	340	295	M16	8

TOOLS, EQUIPMENT, ACCESSORIES

Dytron Welder Polys P-4 650 W

Hand welding machines from renowned Czech manufacturer, equipped with precise electronic control and, depending on the type, the original TraceWeld acoustic weld guide. Their greatest advantage is the possibility of continuous operation, even in demanding conditions. Arc welder in the 650 W version.

						#	P [W]	#
P-4a	pcs	1	1	1.60	6.21	AA403001650	650	thermostat
P-4b	pcs	1	1	2.00	6.21	AA403002650	650	electronic regulation

Dytron Welder Polys P-4 850 W

Manual welding machines designed for professionals, equipped with precise electronic control and, depending on the type, the original TraceWeld acoustic weld guide. Their greatest advantage is the possibility of continuous operation, even in demanding conditions. Mandrel welder in 850 W version, on which two attachments can be clamped at the same time.

						#	P [W]	#
P-4a	pcs	1	1	1.75	6.21	AA404001850	850	electronic regulation

Dytron Welder Polys P-4 1200 W

For welding large dimensions up to 125 mm, we offer a flat welder with an input power of 1200 W. The manual welder is designed for professionals, is equipped with precise electronic control and, depending on the type, the original TraceWeld acoustic weld guide. Its greatest advantage is the possibility of continuous operation, even in demanding conditions.

						#	P [W]	#
P-4a	pcs	1	1	2.10	63.00	AA405001120	1200	electronic regulation

Dytron Welder Polys P-1b 500 W

A special feature of this category of welding machine is the P-1b mandrel angle design, which allows working in confined spaces when working "around the corner". Welders that are equipped with thermostatic control are designed more for occasional operation.

						#	P [W]	#
P-1b	pcs	1	1	1.49	6.21	AA406001500	500	thermostat

Mini set SE 22

Practical set for polyfusion welding with thermostatic control designed for DIYers and undemanding craftsmen. The red metal case is durable, the welder has a long service life. Contents: mandrel welder SE 22, blue clamping attachments ø 20, 25 and 32 mm, metal case MINI, shears DYNO, stand, Allen key 4 mm.

						#	P [W]	#
SE 22	set	1	1	5.12	8.52	AA407003022	650	electronic regulation

Mini set SE 42

Practical set for polyfusion welding with thermostatic control designed for DIYers and undemanding craftsmen. The red metal case is durable, the welder has a long service life. Contents: flat welder SE 42, blue pair of attachments ø 20, 25, 32 and 40 mm, sheet metal case MINI, shears DYNO, stand, Allen key 4 mm.

						#	P [W]	#
SE 42	set	1	1	5.40	8.52	AA408001042	850	electronic regulation

Profi set SE 22

Practical professional set with electronic control for polyfusion welding designed for all-day use by the most demanding craftsmen. The robust metal case is durable, the welder has a long service life. Contents: mandrel welder SE 22, blue cell attachments ø 20, 25, 32, 40, 50, 63 mm, sheet metal case PROFI, foot stand, DYNO shears, Allen key 4 mm.

						#	P [W]	#
SE 22	set	1	1	8.26	16.58	AA409000022	650	electronic regulation

Profi set SE 42

Practical professional set with electronic control for polyfusion welding designed for all-day use by the most demanding craftsmen. The robust metal is durable, the welder has a long service life. Contents: flat welder SE 22, blue cell attachments ø 20, 25, 32, 40, 50, 63 mm, sheet metal case PROFI, foot stand, DYNO shears, Allen key 4 mm.

						#	P [W]	#
SE 42	set	1	1	8.30	16.58	AA410000042	850	electronic regulation

Adapter paired for SE 42, blue

Pair attachments for use only with flat welding machines. They allow welding of pipes from the smallest diameters d20 to d110. Depending on the size, one to two attachments can be mounted on the welder at the same time. The blue coating doubles the service life.

						#
20	set	1	1	0.06	0.03	AA411020001
25	set	1	1	0.10	0.06	AA411025001
32	set	1	1	0.18	0.10	AA411032001
40	set	1	1	0.23	0.14	AA411040001
50	set	1	1	0.34	0.20	AA411050001
63	set	1	1	0.63	0.32	AA411063001
75	set	1	1	0.84	0.45	AA411075001
90	set	1	1	1.52	0.73	AA411090001
110	set	1	1	1.70	1.69	AA411110001

Adapter paired for welding saddle

Pair attachments for use only with flat welding machines. They allow welding of additional branch seats from d20 to d63 on pipes d63 to d250. Depending on the size, one to two extensions can be mounted on the welder at a time.

						#
63 × 32	set	1	1	0.300	0.137	AA412063032
75 × 32	set	1	1	0.300	0.137	AA412075032
90 × 32	set	1	1	0.300	0.137	AA412090032
110 × 40	set	1	1	0.300	0.137	AA412110040
75–125 × 25	set	1	1	0.280	0.655	AA412125025
75–125 × 32	set	1	1	0.410	0.655	AA412125032
75–125 × 40	set	1	1	0.230	0.655	AA412125040
75–125 × 50	set	1	1	0.230	0.655	AA412125050
75–125 × 63	set	1	1	1.164	2.639	AA412125063
160–250 × 25	set	1	1	0.170	0.160	AA412160025
160–250 × 32	set	1	1	0.230	0.160	AA412160032
160–250 × 40	set	1	1	0.360	0.160	AA412160040
160–250 × 50	set	1	1	0.650	0.160	AA412160050
160–250 × 63	set	1	1	1.040	0.160	AA412160063

Drill for welding saddle

Essential tools to create the correct hole for inserting the welding seat.

						#
25	pcs	1	1	0.164	0.10	AA414025000
32	pcs	40	1	0.228	0.10	AA414032000
40	pcs	40	1	0.256	1.10	AA414040000
50	pcs	1	1	0.347	0.46	AA414050000
63	pcs	1	1	0.466	0.46	AA414063000

Adapter non-paired for SE 22, blue

Jaw attachments for use only with mandrel welders. They allow welding of pipes from the lowest diameters d16 to d63. Depending on the size, one to two attachments can be fitted to the welder at a time. The blue coating doubles the service life.

						#
16	pcs	1	1	0.13	0.13	AA415016001
20	pcs	1	1	0.11	0.15	AA415020001
25	pcs	1	1	0.14	0.19	AA415025001
32	pcs	1	1	0.22	0.30	AA415032001
40	pcs	1	1	0.33	0.41	AA415040001
50	pcs	1	1	0.48	0.57	AA415050001
63	pcs	1	1	0.73	0.85	AA415063001

Repairing set

Allows easy repair of the pipe in case of accidental drilling without the need to replace the pipe in the wall. Can only be used with mandrel welders. Please watch the instructional video before use.

						#
	set	1	1	0.20		AA418000000

Repairing stake

Consumables for the repair kit.

						#
	set	1	5	0.03		AA419000000

Shears

High-quality, tried-and-tested light alloy tools with sufficient performance and operator comfort for professional cutting of PP-R, PP-RCT, PE-RT and HDPE pipes of all supplied dimensions.

						#
M1 d32	pcs	25	1	0.34	0.96	AA424032000
MS d40	pcs	15	1	0.42	0.96	AA424040000
M4 d63	pcs	2	1	1.17	3.17	AA424063000

Tightening spanner with belt

Essential tool for correct fixing and tightening of fittings containing a shot brass thread in the plastic part.

						#
	pcs	1	1	0.33	0.72	AA425000000

Spiral for sewer cleaning

A practical helper for every plumber.

						#
2.5 m	pcs	1	1	0.64	1.88	AA426000003
5.0 m	pcs	1	1	1.21	2.50	AA426000005
10.0 m	pcs	1	1	4.73	6.48	AA426000010
20.0 m	pcs	1	1	9.40	10.11	AA426000020
25.0 m	pcs	1	1	11.93	11.55	AA426000025

Spider 125 with universal clamping

Practical lightweight welding jig. Special clamping device with two self-centring jaws, operated by a handle. Allows easy and precise welding of pipes and fittings with diameters from 63 to 125 mm. The tool is supplied in a durable stainless-steel case. The jig itself is lightweight (only 7.5 kg) and can be used for both bench and overhead welding. Note: the green stand is not part of the Spider 125 assembly jig. It can be ordered separately under the name Spider Demo Stand.

						#
39 × 51 × 24 cm	pcs	1	1	14.6	47.74	AA428050125

Pipe insulation Tubex (foamed PE)

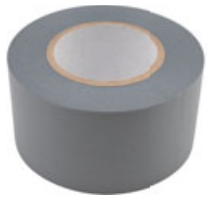
System: **AQUA**
Material: PE
Standard: –

Note: Excellent supplement for thermal and acoustic insulation of water and heating distribution. Made of polyethylene foam with a fine closed cell structure. Tubex significantly reduces heat loss, prevents condensation on cold water distribution and refrigeration equipment, dampens sounds.

						#
18 × 6	m	520	2	0.01	0.92	AA970018006
18 × 10	m	320	2	0.02	1.50	AA970018010
22 × 6	m	400	2	0.02	1.20	AA970022006
22 × 10	m	270	2	0.04	1.78	AA970022010
28 × 6	m	280	2	0.02	1.71	AA970028006
28 × 10	m	190	2	0.04	2.53	AA970028010
35 × 6	m	210	2	0.03	2.53	AA970035006
35 × 10	m	150	2	0.04	3.20	AA970035010
42 × 10	m	120	2	0.04	4.00	AA970042010
42 × 15	m	80	2	0.07	6.00	AA970042015
52 × 10	m	80	2	0.07	6.00	AA970052010
52 × 15	m	70	2	0.10	6.86	AA970052015
65 × 10	m	66	2	0.08	7.27	AA970065010
68 × 15	m	54	2	0.11	8.89	AA970065015
76 × 10	m	50	2	0.11	9.60	AA970076010
76 × 15	m	38	2	0.11	12.63	AA970076015
92 × 15	m	28	2	0.14	17.14	AA970092015
92 × 20	m	24	2	0.20	20.00	AA970092020
114 × 15	m	20	2	0.56	24.00	AA970114015

Insulation adhesive tape

System: **AQUA**
Material:
Standard: –
Note: Special tape for wrapping cut insulation.



40 mm × 20 mm	m	25	1	0.142	0.176	AA972000020

Insulation clip

System: **AQUA**
Material: PP-R
Standard: –
Note: Special clamp to ensure gapless insulation of the distribution system.

	pcs	10000	100	0.01	0.01	AA973000000

Insulation felt

System: **AQUA**
Material:
Standard: –
Note: For thermal insulation of pipes in areas where Tubex insulation cannot be used.

70 mm × 10 m	pcs	50	1	0.16	3.10	AA974000000

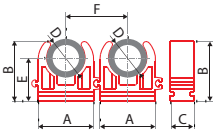
Teflon insulation tape

System: **AQUA**
Material: teflon
Standard: –
Note: Tape for sealing threaded piping joints.

10 m	pcs	300	10	0.01	0.06	AA975001010

Clip PP

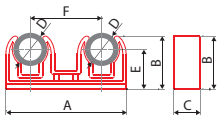
System: **AQUA**
Material: PP-R
Standard: –
Note: Attachment for sliding the pipe on the walls. When ordering black clips, replace AA in the ordering code with BB, or contact customer service.



							A [mm]	B [mm]	C [mm]	E [mm]	F [mm]
16	pcs	750	50	0.02	0.03	AA976016001	33.7	29.9	15.7	24.2	30.0
20	pcs	400	50	0.03	0.05	AA976020001	30.0	32.3	16	24.4	34.5
25	pcs	400	50	0.05	0.06	AA976025001	35.3	38.0	16.0	28.0	39.5

Double clamp PP

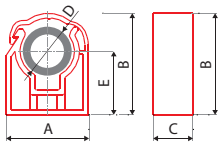
System: **AQUA**
Material: PP-R
Standard: –
Note: Plastic clip for sliding mount of parallel pipes on the wall.



						#	A [mm]	B [mm]	C [mm]	E [mm]	F [mm]
2 × 16	pcs	500	50	0.01	0.04	AA976016002	65.3	30.2	15.9	24.2	40.4
2 × 20	pcs	450	50	0.02	0.05	AA976020002	70.5	34.8	15.9	25.5	43.4
2 × 25	pcs	200	50	0.03	0.06	AA976025002	89.0	40.0	15.8	27.8	54.7

Clip with clamp

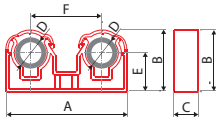
System: **AQUA**
Material: PP-R
Standard: –
Note: Pipe clamp for sliding pipe fixing with locking clamp for fixing on walls and ceilings.



						#	A [mm]	B [mm]	C [mm]	E [mm]
15	pcs	600	50	0.01	0.03	AA977015001	25.0	33.5	16.0	22.5
18	pcs	600	50	0.01	0.03	AA977018001	28.0	36.5	16.0	24.0
20	pcs	400	50	0.02	0.04	AA977020001	31.0	38.0	16.0	25.0
22	pcs	400	50	0.02	0.04	AA977022001	33.0	40.5	16.0	26.0
25	pcs	400	50	0.02	0.04	AA977025001	35.0	43.5	16.0	28.0

Double clip with clamp

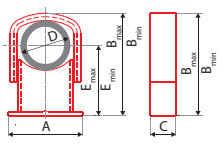
System: **AQUA**
Material: PP-R
Standard: –
Note: Clamp for sliding attachment of parallel pipes with locking clamp for fixing on walls and ceilings.



						#	A [mm]	B [mm]	C [mm]	E [mm]	F [mm]
15	pcs	200	50	0.02	0.06	AA977015002	61.2	33.5	16.0	22.5	36.2
18	pcs	300	50	0.02	0.06	AA977018002	70.2	36.5	16.0	24.0	42.2
20	pcs	300	50	0.04	0.08	AA977020002	76.2	38.0	16.0	25.0	45.2
22	pcs	300	50	0.04	0.08	AA977022002	81.2	40.5	16.0	26.0	48.2
25	pcs	150	50	0.04	0.08	AA977025002	90.2	43.5	16.0	28.0	55.2

Spacing clip

System: **AQUA**
Material: PP-R for 16–25, PS for 25–50
Standard: –
Note: Universal clamp for sliding attachment of pipes of different diameters on walls and ceilings.

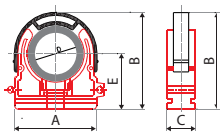


						#	A [mm]	Bmin [mm]	Bmax [mm]	C [mm]	Emin [mm]	Emax [mm]
16–25	pcs	200	50	0.01	0.05	AA978016025	43.2	42.0	51.5	29.5 (32)	30.0	34.5
25–50	pcs	50	25	0.05	0.20	AA978025050	70.2	76.5	101.5	35.4 (38)	56.5	69.0

Clip with strap

System: **AQUA**
Material: PP-R
Standard: –

Note: Highly reliable sliding pipe clamp with locking strap for mounting on walls and ceilings. When ordering black clips, replace AA in the ordering code with BB, or contact customer service.



						#	A [mm]	B [mm]	C [mm]	E [mm]
32	pcs	400	50	0.02	0.05	AA979032000	52.5	54.7	15.8	31.8
40	pcs	300	50	0.03	0.06	AA979040000	63.4	63.6	15.8	36.6
50	pcs	150	25	0.04	0.16	AA979050000	80.2	77.0	18.7	40.4
63	pcs	100	25	0.05	0.19	AA979063000	96.3	91.0	18.9	46.6
75	pcs	60	1	0.10	0.38	AA979075000	120.1	90.6	24.1	62.5
90	pcs	40	1	0.12	0.50	AA979090000	138.7	129.3	24.2	68.3
110	pcs	30	1	0.15	0.64	AA979110000	164.0	149.2	24.0	78.3

Metal sleeve with nut

System: **AQUA**
Material:
Standard: –

Note: For firm pipe fixing, also suitable for riser lines. Creates a fixed point (to be taken into account when planning compensation).

						#
20	pcs	100	1	0.04	0.04	AA980020000
25	pcs	100	1	0.04	0.04	AA980025000
32	pcs	80	1	0.05	0.05	AA980032000
40	pcs	80	1	0.06	0.06	AA980040000
50	pcs	50	1	0.07	0.16	AA980050000
63	pcs	50	1	0.11	0.19	AA980063000
75	pcs	24	1	0.16	0.38	AA980075000
90	pcs	24	1	0.19	0.50	AA980090000
110	pcs	18	1	0.25	0.64	AA980110000

Screw combi

System: **AQUA**
Material:
Standard: –

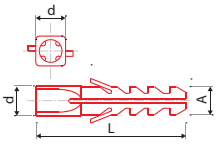
Note: Screw for metal sleeves.

						#
M8 × 100	pcs	100	1	0.04	0.04	AA981008100

Wall anchor

System: **AQUA**
Material: PP-R
Standard: –

Note: High-quality anchors with square cross-section and thick wall. Holds the screw firmly and does not twist.



						#	A [mm]	D [mm]	L [mm]
6 mm	set	800	20	0.01	0.03	AA982006000	5.6	6	30
8 mm	set	480	20	0.02	0.04	AA982008000	7.5	8	40
10 mm	set	170	10	0.03	0.07	AA982010000	9.5	10	50
12 mm	set	120	10	0.04	0.13	AA982012000	11.7	12	60

Threaded bar

System: **AQUA**
Material: galvanized steel
Standard: –

Note: Threaded rod made of high-quality galvanized steel.

M8 × 1000 mm	pcs	50	1	0.04	0.33	AA983008000

Plastic cable tray

System: **AQUA**
Material: PVC-RE
Standard: –

Note: PVC cable groove suitable for conducting pipes. Standard groove length 4 m.

120 × 100 × 4000 mm	m	4	4	AA985012004	1.75	12

Cable tray cover

System: **AQUA**
Material: PVC-RE
Standard: –

Note: Cover for cable groove with a reliable fitting system. Standard length 1 m. Colour grey.

146 × 30 × 1000 mm	m	1	1	AA986013001	1.3	4.38

Galvanized pipe tray (2 m)

System: **AQUA**
Material:
Standard: –

Note: Groove for supporting one pipe in areas where clamps cannot be used.

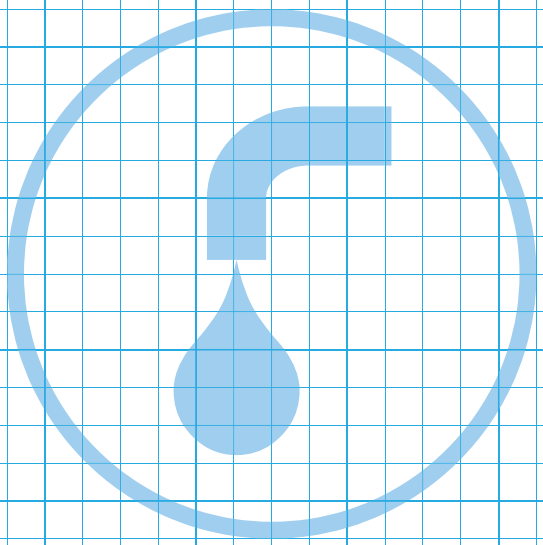
16 × 2 m	pcs	25	1	0.29	0.26	AA987016002
20 × 2 m	pcs	25	1	0.34	0.40	AA987020002
25 × 2 m	pcs	25	1	0.44	0.63	AA987025002
32 × 2 m	pcs	25	1	0.53	1.02	AA987032002
40 × 2 m	pcs	20	1	0.62	1.60	AA987040002
50 × 2 m	pcs	20	1	0.76	2.50	AA987050002
63 × 2 m	pcs	15	1	0.90	3.97	AA987063002
75 × 2 m	pcs	15	1	1.07	5.63	AA987075002
90 × 2 m	pcs	10	1	1.11	5.63	AA987090002

LDPE (rPE) pipe

System: **AQUA**
Material:
Standard: –

Note: Special tube for connection to flushing systems, etc.

10 x 2.0	kg	1	1	AA988000000	1.00	0.07	10	2



ASSEMBLY INSTRUCTIONS

1. SYSTEM USE

The FV AQUA PP-R and PP-RCT system enables the implementation of distribution in residential buildings, administrative and public buildings, industry and agriculture.

It is designed for the transport of cold and hot water and in compliance with the prescribed rules for central heating. For individual applications, it is necessary to select a suitable type of pipe with the corresponding parameters of the operating temperature and pressure limits. The FV AQUA system offers pipes PP-R, PP-RCT HOT, PP-RCT UNI and PP-RCT FASER HOT.

The system can also be used for air distribution. The possibility of conducting other liquid, gaseous or solid substances must be assessed in each specific case.

All pipes can be connected with a comprehensive range of PP-R fittings connected by polyfusion welding (up to 125 mm in diameter) or butt welding (diameters from 160 mm)

Water distribution

The system can be used for all internal water pipes (cold water, utility water, hot water, hot water for circulation). The plastic piping system is expected to last 50 years with the right choice of material, pipe type and application.

The type of pipe, depending on the hot water heating system and its temperature regulations is chosen by a project architect. In the hot water distribution system, a maximum temperature of 57 °C is assumed at the point of the tap to protect against scalding. In the distribution systems themselves, short-term overheating of the hot water at the heating point up to 70 °C is expected, for hygienic reasons due to the elimination of pathogenic organisms.

Heating distribution

When assessing the suitability of a specific type of heating pipe, it is necessary to use the value of the inlet calculated heating water temperature, which is the highest temperature that occurs in the system. The project architect of the heating system chooses it depending on the required temperature at the inlet to the radiators, according to the technical possibilities of the heat source and the type of expansion vessel

Recommended values for heating			
temperature range			
70/50 °C	70/60 °C	75/65 °C	80/60 °C
and for low temperature systems			

When installing plastic pipes behind a boiler we recommend installing 1.5–2 m of metal pipes as an added protection in case of the system overheating.

The method of leading the pipes is same for either water or heat distribution The basic requirements are the provision of mechanical protection of the pipeline and the provision of pipeline support and expansion joint compensation

Piping can be led:

- in the grooves of the walls
- in installation partitions (pre-wall mounting)
- in floors, ceilings
- along the walls (freely or in covers)
- in installation shafts and sewerages
- under plaster
- in plasterboard partitions and ceilings

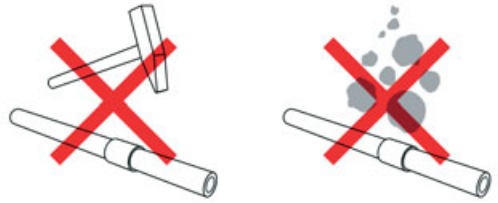
Piping outside the building must be assessed according to specific conditions.

2. ASSEMBLY INSTRUCTION

2.1. Warning:

Only elements that have not been damaged or soiled during transport and storage may be used.

The minimum temperature for the assembly of plastic pipes is with regard to welding +5 °C. At lower temperatures, it is difficult to ensure the conditions for creating quality joints.



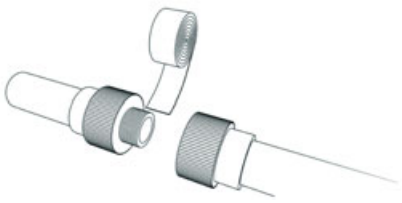
Throughout assembly and transport, the elements of the plastic system must be protected against impacts, shocks, falling materials and other forms of mechanical damage.

Pipe bending is performed without heating at a temperature of at least + 15 °C. For pipes with a diameter of 16–32 mm, the minimum bending radius is 8 times the pipe diameter (D).

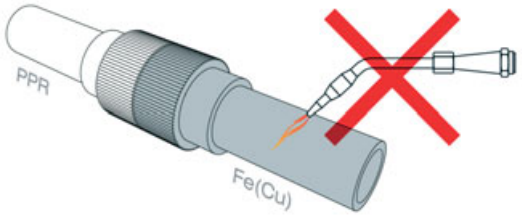
It is not permissible to bend the pipes by heating with open flame or hot air.

Pipe crossing is done with special fittings for this purpose.

Joining of plastic parts is performed by polyfusion welding, further welding by using electric fittings and butt welding. During welding, a homogeneous joint of high quality is created. The exact procedure must be followed and suitable tools must be used.

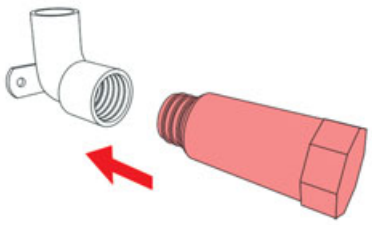


Metal threaded fittings must be used for permanent threaded connections. Threading plastic elements is prohibited. The threads are sealed with Teflon tape, sealing thread or special sealants.



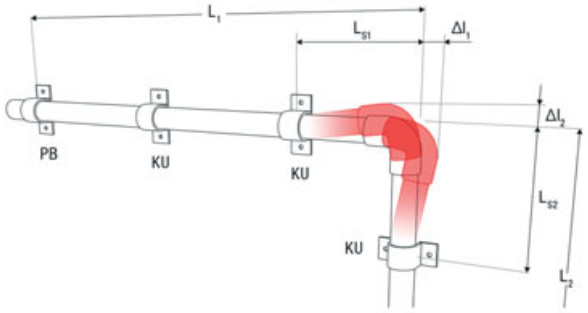
If the combined fitting is followed by a metal pipe, it cannot be connected by soldering or welding in the vicinity of the fitting due to the possible heat transfer to the fitting.

For temporary or short-term closure of wall elbows or universal wall sets before installation of outlet fittings, we recommend using plastic plugs (plastic plugs are intended for temporary use only – eg pressure test). Metal threaded plugs must be used for long-term sealing.



2.2 Longitudinal expansion and contraction

The difference between the temperatures during installation and during operation, when a medium with a different temperature than the temperature during installation is transported in the pipeline, causes length changes – lengthening or shortening (Δl).



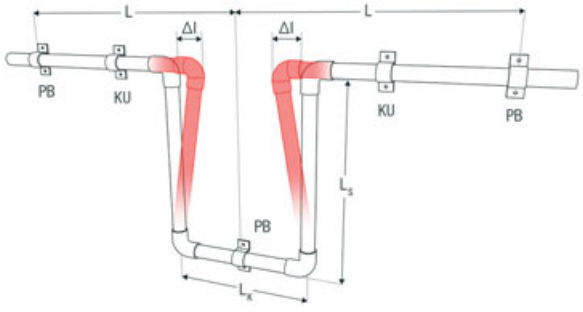
$$\Delta l = \alpha \cdot L \cdot t \ [mm]$$

- Δl length change [mm]
- α coefficient of thermal longitudinal expansion [mm/m °C], for all-plastic pipe design PP-R and PP-RCT α = 0.15 | for FASER α = 0.05
- L calculated length (distance of two adjacent fixed points in a straight line) [m]
- t temperature difference during installation and operation [°C]

$$LS = k \cdot \sqrt{(D \cdot \Delta l)} \ [mm]$$

- L_s free compensation length
- k material constant for PP-R k = 20
- D outer pipe diameter [mm]
- Δl length change [mm] calculated from the previous formula

U-compensator



- *PB* fixed point
- *KU* siding point
- L calculated pipe length
- L_s compensation length
- Δl length change
- L_K compensator width

$$Lk = 2 \cdot \Delta l + 150 \ [mm] \text{ and at the same time } Lk \geq 10 \cdot D$$

- LK compensator width
- Δl length change [mm]
- D outer pipe diameter [mm]

Appropriate compensation method: the pipe is deflected in a direction perpendicular to the original route and a free compensation length (designation LS) is left on this perpendicular, which ensures that significant additional compressive and tensile stresses do not occur in the pipe wall when dilating the straight route. The compensation length Ls depends on the calculated lengthening (shortening) of the route, material and pipe diameter.

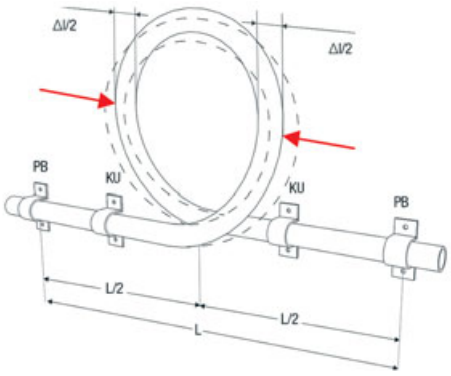
Polypropylene uses the flexibility of the material to compensate for length changes. In addition to compensation in the bending of the pipeline, bending "U" compensators and compensation loops are used.

The value of the length change Δl can also be read from the graphs.

Chart for installation of FV PP-R compensation loop

Pipe diameter [mm]	Distance of fixed points L [m]	
	FASER	PP-R and PP-RCT
16	24	8
20	27	9
25	30	10
32	36	12
40	42	14

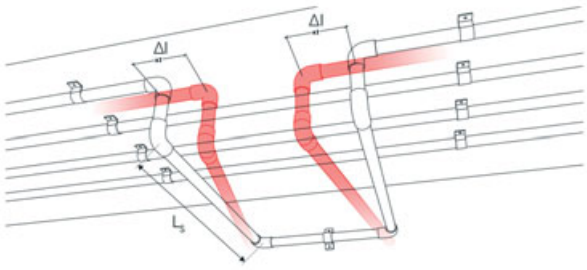
FV PP-R compensation loop



Before welding the FV PP-R compensation loop, press it in the direction of the arrows and weld it by pressing the calculated value Δl.

- *PB* Fixed point
- *KU* Siding point
- L Calculated pipe length

Example of compensation by changing the route adapted to the building structure

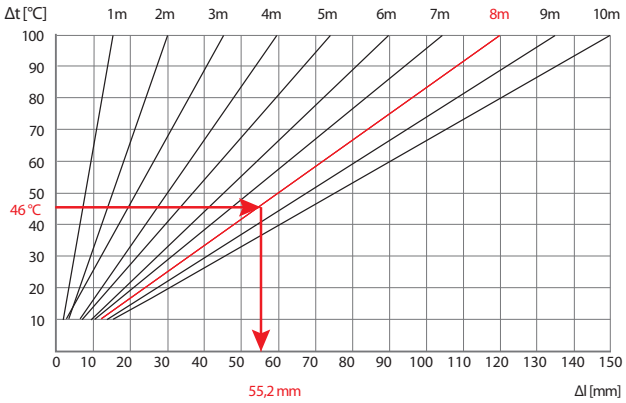


"U" compensator

The calculated free length Ls means the length without any fixed supports or hinges that would prevent expansion. The free length Ls should not exceed the maximum distance of the supports depending on the pipe diameter and the medium temperature.

Length extension: all-plastic pipes PP-R and PP-RCT

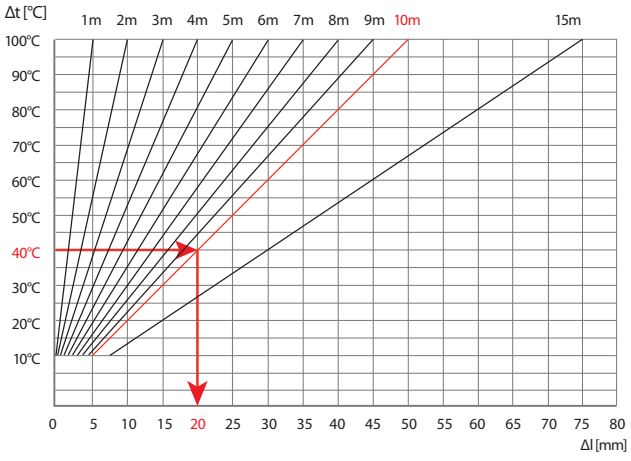
Example: L = 8 m, Δt = 46 °C



Pipe length [m]	Temperature difference Δt							
	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C
	length change [mm]							
1	1.5	3	5	6	8	9	11	12
2	3	6	9	12	15	18	21	24
3	5	9	14	18	23	27	32	36
4	5	9	14	18	23	27	32	36
5	8	15	23	30	38	45	53	60
6	9	18	27	36	45	54	63	72
7	11	21	32	42	53	63	74	84
8	12	24	36	48	60	72	84	96
9	14	27	41	54	68	81	95	108
10	15	30	45	60	75	90	105	120
15	23	45	68	90	113	135	158	150

Length extension: FASER pipes

Example: L = 10 m, Δt = 40 °C



Pipe length [m]	Temperature difference Δt							
	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C
	length change [mm]							
1	1	1	2	2	3	3	4	4
2	1	2	3	4	5	6	7	8
3	2	3	5	6	8	9	11	12
4	2	4	6	8	10	12	14	16
5	3	5	8	10	13	15	18	20
6	3	6	9	12	15	18	21	24
7	4	7	11	14	18	21	25	28
8	4	8	12	16	20	24	28	32
9	5	9	14	18	23	27	32	36
10	5	10	15	20	25	30	35	40
15	8	15	23	30	38	45	53	60

2.3. Pipe support distances

Consistent fastening of plastic pipes depends mainly on the longitudinal expansion of the material. The mutual distance of the pipe supports depends on the operating conditions, the material of the pipe, the weight of the pipe and the weight of the transported medium. The total length of the pipe must be divided into individual parts – expansion sections, in which expansion or contraction is allowed. Expansion joints delimit fixed points PB. Between the fixed points, the pipe is mounted on sliding points KU. Support distances for individual types of pipes are in the following charts.

Maximum support distance of all-plastic pipes FV PP-RCT UNI for horizontal pipes

Pipe diameter [mm]	Support distance [cm] at water temperature		
	20 °C	30 °C	40 °C
16	75	70	70
20	80	75	70
25	85	85	85
32	100	95	95
40	110	110	105
50	125	120	115
63	140	135	130
75	155	150	145
90	165	165	155
110	185	180	175
125	200	195	185

Maximum support distance of all-plastic pipes FV PP-R CLASSIC S3.2 SDR7.4 (PN 16) and FV PP-RCT HOT S3.2 SDR7.4 for horizontal pipes.

Pipe diameter [mm]	Support distance [cm] at water temperature					
	20 °C	30 °C	40 °C	50 °C	60 °C	80 °C
16	80	75	75	70	70	60
20	90	80	80	80	70	65
25	95	95	95	90	80	75
32	110	105	105	100	95	80
40	120	120	115	105	100	95
50	135	130	125	120	115	100
63	155	150	145	135	130	115
75	170	165	160	150	145	125
90	180	180	170	165	160	135
110	200	195	190	180	175	155
125	220	215	200	195	190	165

Maximum support distance of pipes FV PP-R CLASSIC S2.5 SDR6 (PN20) for horizontal pipes

Pipe diameter [mm]	Support distance [cm] at water temperature					
	20 °C	30 °C	40 °C	50 °C	60 °C	80 °C
16	90	85	85	80	80	65
20	95	90	85	85	80	70
25	100	100	100	95	90	85
32	120	115	115	110	100	90
40	130	130	125	120	115	100
50	150	150	140	130	125	110
63	170	160	155	150	145	125
75	185	180	175	160	155	140
90	200	200	185	180	175	150
110	210	215	210	195	190	165
125	235	230	225	210	200	170

Maximum support distance of multilayer pipes FV PP-RCT FASER HOT for horizontal pipes.

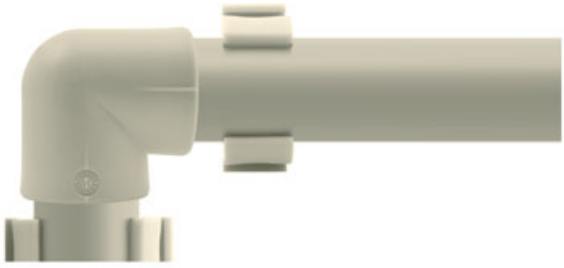
Pipe diameter [mm]	Support distance [cm] at water temperature						
	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C
20	100	90	85	85	80	70	65
25	105	100	95	90	85	80	75
32	120	115	110	105	100	95	90
40	130	125	120	115	110	105	100
50	150	145	140	135	130	125	120
63	160	155	150	145	140	135	130
75	180	175	170	165	160	155	145
90	190	185	180	175	170	165	150
110	200	195	190	180	175	170	160
125	220	210	205	195	185	175	165
160	220	210	205	195	185	175	165
200	245	235	225	220	210	200	190
250	275	265	255	245	235	225	210

For vertical pipes of all types of pipes, the maximum support distances are multiplied by a coefficient of 1.3.

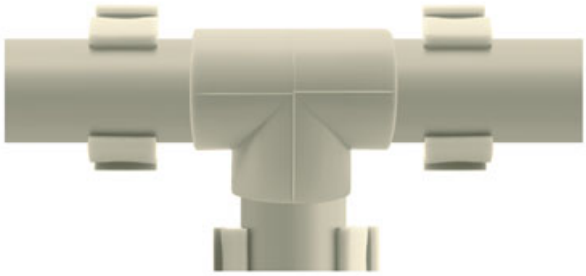
2.4. Pipe fixing

For leading the pipeline route, it is necessary to respect the distribution material, ie. especially longitudinal thermal expansion, the need for compensations, given operating conditions (combination of pressure and temperature) and the method of joining.

The distribution mounting is done in such a way that the fixed points (PB) and sliding points (KU) are distinguished for the expected length change of the pipeline.

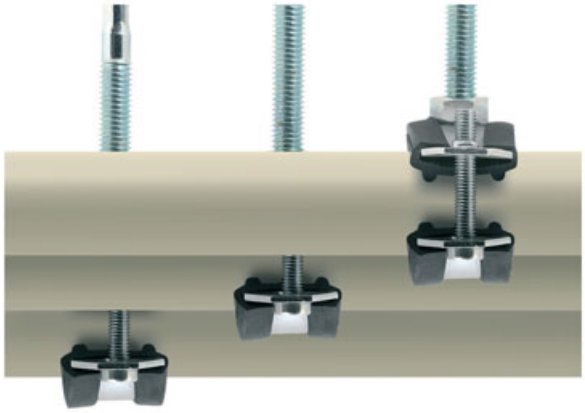


KU in pipe bend



KU at the turn

KU in the place of fitting the pipe

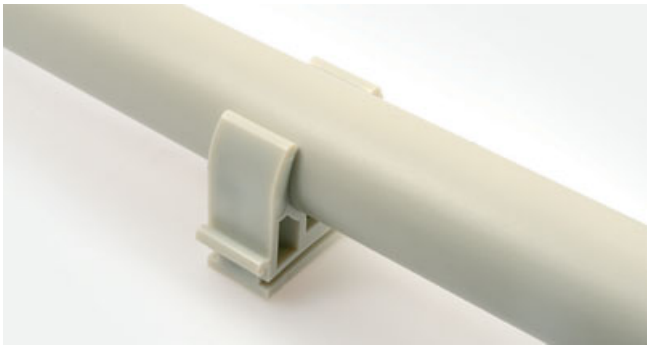


PB with tightly clamped sleeves (only for horizontal pipes)

PB by mounting on the fitting

KU free sleeve

Use of plastic sleeves on cold water

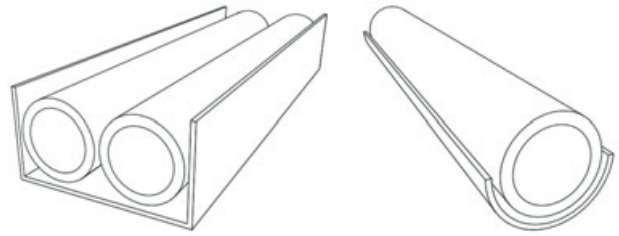


Suitable for cold water distribution

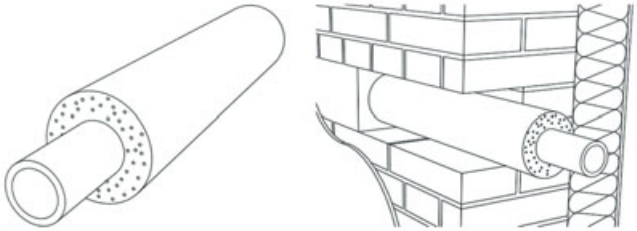
Use of plastic sleeves on cold water

For hot water, the sleeve is installed over a larger insulation

Other ways of laying plastic pipes



By laying the pipes in a free drain



Piping in insulation under plaster

Pipe leading

The piping must be installed with a slope of at least 0.5% to the lowest places where it can be drained by a separate drain or shut-off valves with drainage.

The piping must be divided into separately closable parts. Direct valves or plastic taps are used for closing, under plaster valves or taps are used for flush-mounted installation. Before mounting the element, it is necessary to test the closing ability.

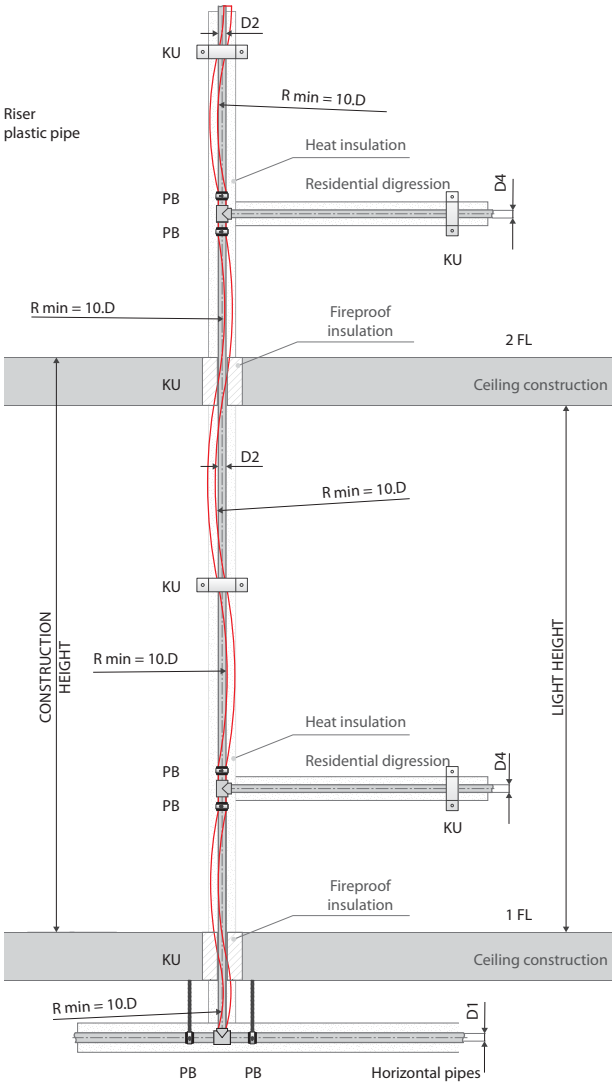
To terminate the pipe under the plaster at the installation site of the mixing outlet fitting, it is recommended to use a FV PP-R wall set (double plate), where the pitch of the threads is shifted so that any deviation from the horizontal axis can be leveled. A novelty are FV PP-R elbows with a metal UNI internal thread, which together with the DUO or MONO washer form a variant of wall elbows and a double wall elbow with an adjustable spacing. For installation under plasterboard, FV PP-R wall elbows for plasterboard are intended.

When routing water pipes in installation partitions, it is necessary to secure the position of the pipes with a suitable fastening, eg a system of metal sleeves with support elements. The piping must be laid with the possibility of expansion and insulated.

When laying water pipes in floor or ceiling structures, flexible plastic protectors (made of polyethylene) are used on the pipes, which ensure mechanical protection of the pipes and at the same time the air gap between the pipes and the protector creates thermal insulation. Loose plastic pipes must be provided with good insulation (for example, if the cold water pipe is laid freely along the wall in a heated room, there is a high risk of moisture condensation on the pipe wall). The pipeline can be run freely along the wall only in areas where there is no risk of mechanical damage to the pipeline during operation.

2.5. Riser piping

Care must be taken in the riser on the location of fixed points (PB), sliding points (KU) and on the creation of a suitable compensation method. Compensation is provided on the risers either by sliding on the base of the riser or by using a compensation loop.



EXPLANATIONS:

Pipes before heating

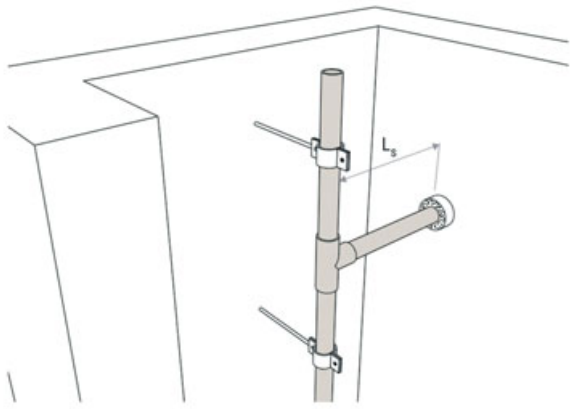
Pipes after heating

PB	Fixed point
KU	Siding point
D	Outer pipe diameter [mm]
R min	Minimum bending radius

Assembly instruction

If it is necessary to divide the riser into several expansion sections, this is done by placing fixed points. A fixed point on the riser is installed below and above the T-piece at the digression or at the socket at the pipe connection, thus preventing the riser from falling. Pipe expansion must then be allowed between the fixed points.

When branching the connecting pipe, the expansion of the riser must be taken into account:



Sufficient distance of the riser from the passage through the wall

FASER pipes have 3× lower expansion and greater rigidity than all-plastic pipes. The pipes can therefore be mounted on the same principle described above as all-plastic pipes, ie with the classic procedure of solving compensations, when the possible larger distances of supports will be used and the expansion and compensation lengths will be significantly smaller. When leading in a groove, so-called rigid mounting can also be used – fixed points are mounted on the pipe so that the thermal expansion is transferred to the pipe material and does not manifest itself. The assumption for this installation are sleeves that will be able to actually hold the pipe and will be anchored sufficiently firmly.

2.6. Connecting to the system

The piping system can be connected by welding or mechanical joints.

The connection of the pipe with the fitting is performed identically for all types of pipes, the fittings are identical.

Pipes and fittings are connected by polyfusion welding, larger diameters using an electric fitting or by butt welding. All methods must be performed exactly according to approved work procedures.

Pipe division

The pipes can only be divided (cut) with sharp, well-sharpened tools. It is recommended to use special scissors or a cutter for plastic pipes.

Adapters with pressed brass nickel-plated internal and external threads are generally used for the transition of plastics in hot water and heating pipes.

Tightening wrenches with tape are used to tighten screwed connections with pressed threads, unless the adapter is provided with a polygon directly on the metal part.

Warning:

The use of adapters with plastic threads is not permissible in sanitary engineering for thermal engineering and physical – mechanical reasons. Adapters with plastic threads can be used, for example, when setting up temporary wiring.

Joint seals

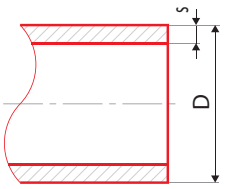
Sealing of screwed joints is done exclusively with Teflon tape, Teflon thread or a special sealing mastic.

MULTIPERT-AL PIPES

FV MULTIPERT-AL coils

System: **AQUA**
Material: PE-RT/AL/PE-RT
Standard: ČSN EN ISO 21003, DIN 4726

Note: Premium system pipes made of PE-RT/AL/PE-RT for cold and hot water distribution and heating in the most demanding conditions. With bending memory and high toughness. Five-layer construction with longitudinally welded aluminium layer. Tmax 95 °C.

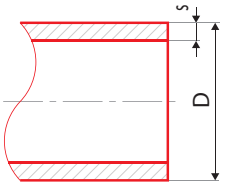


						#	D [mm]	s [mm]	l [m]
16 × 2.0	m	200		0.105	0.20	AA130016200	16	2.00	200
16 × 2.0	m	400		0.105	0.60	AA130016400	16	2.0	400
20 × 2.0	m	200		0.148	0.31	AA130020200	20	2.0	200
26 × 3.0	m	50		0.26	0.51	AA130026050	26	3.0	50
32 × 3.0	m	50		0.34	0.58	AA130032050	32	3.0	50

FV MULTIPERT-AL stiff pipes

System: **AQUA**
Material: PE-RT/AL/PE-RT
Standard: ČSN EN ISO 21003, DIN 4726

Note: Premium PE-RT/AL/PE-RT pipes for cold and hot water distribution and heating in the most demanding conditions. With bending memory and high toughness. Five-layer construction with longitudinally welded aluminium layer. Tmax 95 °C.

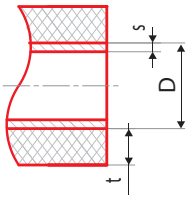


						#	D [mm]	s [mm]	l [m]
16 × 2.0	m	160	4	0.105	0.20	AA130016004	16	2.00	4
20 × 2.0	m	28	4	0.329	0.20	AA130020004	20	2.00	4
26 × 3.0	m	60	4	0.26	0.51	AA130026004	26	3.00	4
32 × 3.0	m	40	4	0.344	0.80	AA130032004	32	3.00	4
40 × 3.5	m	24	4	0.538	1.26	AA130040004	40	3.50	4

FV MULTIPERT-AL ISO 6

System: **AQUA**
Material: PE-RT/AL/PE-RT
Standard: ČSN EN ISO 21003, DIN 4726

Note: Pre-insulated pipes made of PE-RT/AL/PE-RT for cold and hot water distribution and heating in the most demanding conditions. Superior insulation with a thickness of 6 mm.

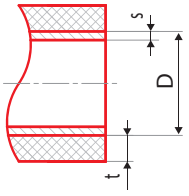


					# 🔵	# 🔴	D [mm]	s [mm]	l [m]
16 × 2.0 × 6	m	50	0.142	0.6	AA136016050	AA136116050	28	8	50
20 × 2.0 × 6	m	50	0.204	0.8	AA136020050	AA136120050	32	8	50
26 × 3.0 × 6	m	50	0.282	1.1	AA136026050	AA136126050	38	8	50
32 × 3.0 × 6	m	25	0.292	1.5	AA136032025	AA136132025	44	8	25

FV MULTIPERT-AL ISO 9

System: **AQUA**
Material: PE-RT/AL/PE-RT
Standard: ČSN EN ISO 21003, DIN 4726

Note: Pre-insulated pipes made of PE-RT/AL/PE-RT for cold and hot water distribution and heating in the most demanding conditions. Superior insulation with a thickness of 9 mm.

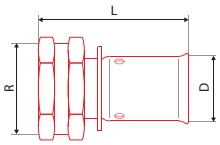


					# 🔵	# 🔴	D [mm]	s [mm]	l [m]
16 × 2.0 × 9	m	50	0.151	0.9	AA139016050	AA139116050	34	11	50
20 × 2.0 × 9	m	50	0.206	1.1	AA139020050	AA139120050	38	11	50
26 × 3.0 × 9	m	50	0.284	1.5	AA139026050	AA139126050	44	12	50
32 × 3.0 × 9	m	25	0.96	2	AA139032025	AA139132025	25	12	25

FV PRESS BRASS PRESS FITTINGS

FV PRESS reducing sleeve with metal female thread

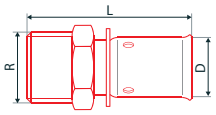
System: **AQUA**
Material: Brass
Standard: –
Note: Transition from MULTI to brass removable couplings.



					#	D [mm]	L [mm]	R
16 × 2.0 – 1/2"	pcs	50	10	0.081	AA301016012	16	54	1/2"
20 × 2.0 – 1/2"	pcs	50	10	0.094	AA301020012	20	54	1/2"
20 × 2.0 – 3/4"	pcs	50	10	0.105	AA301020034	20	56	3/4"
26 × 3.0 – 1"	pcs	50	5	0.138	AA301026010	26	63	1"
26 × 3.0 – 3/4"	pcs	50	5	0.152	AA301026034	26	53	3/4"
32 × 3.0 – 1 1/4"	pcs	50	5	0.164	AA301032054	32	64	1 1/4"

FV PRESS reducing sleeve with metal male thread

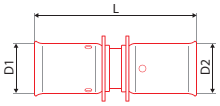
System: **AQUA**
Material: Brass
Standard: –
Note: Transition from MULTI to brass removable couplings.



					#	D [mm]	L [mm]	R [inch]
16 × 2.0 – 1/2"	pcs	390	10	0.0646	AA302016012	16	57	1/2"
20 × 2.0 – 1/2"	pcs	200	10	0.0782	AA302020012	20	57	1/2"
20 × 2.0 – 3/4"	pcs	200	10	0.0954	AA302020034	20	57	3/4"
26 × 3.0 – 1"	pcs	100	5	0.1320	AA302026001	26	62	1"
26 × 3.0 – 3/4"	pcs	200	5	0.1316	AA302026034	26	59	3/4"
32 × 3.0 – 1"	pcs	10	5	0.2020	AA302032001	32	64	1"

FV PRESS coupling

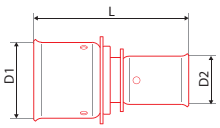
System: **AQUA**
Material: Brass
Standard: –
Note: Reliable pipe connection with low pressure loss.



					#	D1 [mm]	L [mm]	D2 [mm]
16 × 2.0 × 16 × 2.0	pcs	100	10	0.0582	AA305016000	16	66	16
20 × 2.0 × 20 × 2.0	pcs	100	10	0.0836	AA305020000	20	66	20
26 × 3.0 × 26 × 3.0	pcs	50	5	0.1272	AA305026000	26	66	26
32 × 3.0 × 32 × 3.0	pcs	50	5	0.1744	AA305032000	32	68	32

FV PRESS reducer

System: **AQUA**
Material: Brass
Standard: –
Note: Connecting pipes of different diameters with low pressure loss.

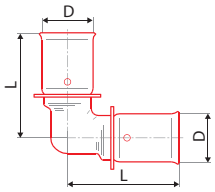


					#	D1 [mm]	L [mm]	D2 [mm]
20 × 2.0 – 16 × 2.0	pcs	10	1	0.074	AA306020016	20	66	16
26 × 3.0 – 16 × 2.0	pcs	5	1	0.088	AA306026016	26	66	16
26 × 3.0 – 20 × 2.0	pcs	5	1	0.113	AA306026020	26	66	20
32 × 3.0 – 20 × 2.0	pcs	5	1	0.189	AA306032020	32	68	20
32 × 3.0 – 26 × 3.0	pcs	5	1	0.197	AA306032026	32	68	26

FV PRESS elbow 90°

System: **AQUA**
Material: Brass
Standard: –

Note: Shaped fitting, 90° change of direction fitting with low pressure loss.

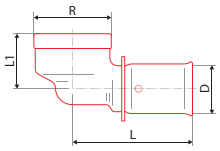


					#	D [mm]	L [mm]
16 × 2.0	pcs	100	10	0.0964	AA309016000	16	47
20 × 2.0	pcs	100	10	0.1248	AA309020000	20	50
26 × 3.0	pcs	50	5	0.1920	AA309026000	26	52
32 × 3.0	pcs	50	5	0.2604	AA309032000	32	55

FV PRESS elbow 90° with metal female thread

System: **AQUA**
Material: Brass
Standard: –

Note: Transition from MULTI piping to brass threaded connections and fittings.

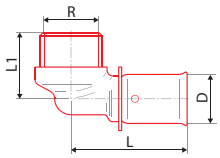


					#	D [mm]	L [mm]	L1 [mm]
16 × 2.0 – 1/2"	pcs	50	10	0.111	AA312016012	16	49	34
20 × 2.0 – 1/2"	pcs	50	10	0.121	AA312020012	20	50	34
20 × 2.0 – 3/4"	pcs	50	10	0.144	AA312020034	20	50	35
26 × 3.0 – 1"	pcs	50	5	0.195	AA312026001	26	55	40
32 × 3.0 – 1"	pcs	50	5	0.272	AA312032001	32	55	46

FV PRESS elbow 90° with metal male thread

System: **AQUA**
Material: Brass
Standard: –

Note: Transition from MULTI piping to brass threaded connections and fittings.

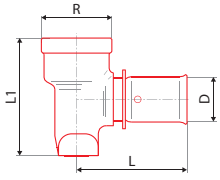


					#	D [mm]	L [mm]	L1 [mm]
16 × 2.0 – 1/2"	pcs	100	10	0.0928	AA313016012	16	49	35
20 × 2.0 – 1/2"	pcs	100	10	0.1086	AA313020012	20	50	35
20 × 2.0 – 3/4"	pcs	100	10	0.1178	AA313020034	20	50	35
26 × 3.0 – 1"	pcs	50	5	0.1976	AA313026001	26	52	41
26 × 3.0 – 3/4"	pcs	50	5	0.1732	AA313026034	26	52	43
32 × 3.0 – 1"	pcs	50	5	0.2428	AA313032001	32	55	46

FV PRESS elbow 90° for wall mounting with female thread

System: **AQUA**
Material: Brass
Standard: –

Note: Shaped fitting for installation of faucet fittings – valves, taps, etc.

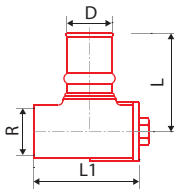


					#	D [mm]	L [mm]	L1 [mm]
16 × 2.0 – 1/2"	pcs	10	1	0.135	AA310016012	16	53	53
20 × 2.0 – 1/2"	pcs	10	1	0.141	AA310020012	20	53	53
20 × 2.0 – 3/4"	pcs	10	1	0.141	AA310020034	20	53	53
26 × 3.0 – 3/4"	pcs	10	1	0.167	AA310026034	26	53	53

Press fittings in all-metal design for pipes Ø 16 to Ø 32 – a reliable connection is created using press pliers (TH, U system), which press the stainless steel ring on the pipe body and the brass part of the fitting. The connection is further inseparable.

FV PRESS universal wall-mount set

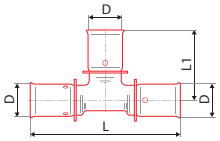
System: **AQUA**
Material: Brass
Standard: –
Note: For fitting outlet faucets.



					#	D [mm]	L [mm]	L1 [mm]
16 × 2.0 – 1/2"	pcs	5	1	0.488	AA315016012	16	48	51.5

FV PRESS tee non-reversible

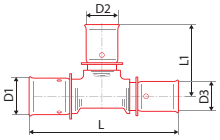
System: **AQUA**
Material: Brass
Standard: –
Note: Shaped fitting for branching of the distribution.



					#	D [mm]	L [mm]	L1 [mm]
16 × 2.0	pcs	100	10	0.1364	AA317016000	16	93	47
20 × 2.0	pcs	100	10	0.1768	AA317020000	20	100	50
26 × 3.0	pcs	50	5	0.2652	AA317026000	26	104	52
32 × 3.0	pcs	50	5	0.3680	AA317032000	32	110	55

FV PRESS tee reduced

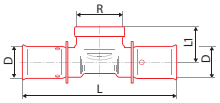
System: **AQUA**
Material: Brass
Standard: –
Note: Shaped fitting for branching into pipes of different diameters.



					#	D1 [mm]	D2 [mm]	D3 [mm]	L [mm]	L1 [mm]
16 – 20 – 16	pcs	50	10	0.1636	AA318162016	16	20	16	100	50
20 – 16 – 16	pcs	50	10	0.1580	AA318201616	20	16	16	100	50
20 – 16 – 20	pcs	50	10	0.1696	AA318201620	20	16	20	100	50
20 – 20 – 16	pcs	50	10	0.1660	AA318202016	20	20	16	100	50
20 – 26 – 20	pcs	50	5	0.2480	AA318202620	20	26	20	106	53
26 – 16 – 16	pcs	50	5	0.3120	AA318261616	26	16	16	105	53
26 – 16 – 26	pcs	50	5	0.2412	AA318261626	26	16	26	104	53
26 – 20 – 20	pcs	50	5	0.2232	AA318262020	26	20	20	104	52
26 – 20 – 26	pcs	50	5	0.2448	AA318262026	26	20	26	104	52
26 – 26 – 20	pcs	50	5	0.2536	AA318262620	26	26	20	104	52
26 – 32 – 26	pcs	50	5	0.3810	AA318263226	26	32	26	112	55
32 – 26 – 26	pcs	50	5	0.3230	AA318322626	32	26	26	110	55

FV PRESS tee with metal female thread

System: **AQUA**
Material: Brass
Standard: –
Note: Allows branching of a part to brass threaded connections and fittings.

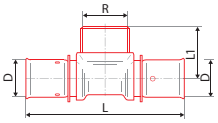


					#	D [mm]	L [mm]	L1 [mm]
16 × 2.0 – 1/2"	pcs	50	10	0.1562	AA319016012	16	97	34
20 × 2.0 – 1/2"	pcs	50	10	0.1720	AA319020012	20	100	34
20 × 2.0 – 3/4"	pcs	50	10	0.2120	AA319020034	20	100	35
26 × 3.0 – 1/2"	pcs	50	5	0.2540	AA319026012	26	104	40
26 × 3.0 – 3/4"	pcs	50	5	0.2736	AA319026034	26	104	40
32 × 3.0 – 1"	pcs	50	5	0.3830	AA319032001	32	110	46

FV PRESS tee with metal male thread

System: **AQUA**
Material: Brass
Standard: –

Note: Allows branching of a part to brass threaded connections and fittings.

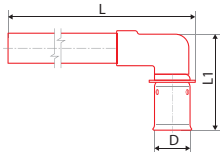


					#	D [mm]	L [mm]	L1 [mm]
16 × 2.0 – 1/2"	pcs	50	10	0.1512	AA320016012	16	97	35
20 × 2.0 – 1/2"	pcs	50	10	0.1576	AA320020012	20	100	35
20 × 2.0 – 3/4"	pcs	50	10	0.1702	AA320020034	20	100	35
26 × 3.0 – 3/4"	pcs	50	5	0.2552	AA320026034	26	104	43

FV PRESS elbow 90° for radiator connection

System: **AQUA**
Material: Brass
Standard: –

Note: Connection elbow 90° for radiator connection.

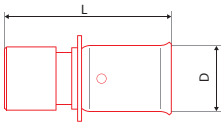


					#	D [mm]	[mm]
20 × 2.0 – Cu 15	pcs	5	1	0.132	AA324016015	15	300

FV PRESS reducing sleeve to CU

System: **AQUA**
Material: Brass
Standard: –

Note: Shaped fitting for transition to Cu heating distribution.

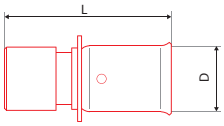


					#	L [mm]
16 × 2.0 – Cu 14	pcs	100	10	0.0748	AA326016014	62
16 × 2.0 – Cu 15	pcs	100	10	0.0748	AA326016015	62
16 × 2.0 – Cu 16	pcs	100	10	0.0748	AA326016016	62

FV PRESS end cap

System: **AQUA**
Material: Brass
Standard: –

Note: Shaped fitting for transition to Cu heating distribution.



					#	D [mm]	L [mm]
16 × 2.0	pcs	100	10	0.0358	AA327016000	16	35
20 × 2.0	pcs	100	10	0.0504	AA327020000	20	35

TOOLS

Calibrator MULTI

System: **AQUA**
Material:
Standard: –

Note: Robust metal calibrator of multilayer MULTI tubes for plastic press fittings of the PRESS system for the most commonly-used diameters 16, 20, 25, 32 mm.

					#
Ø 16–20–25–32	pcs	1	1	0.290	AA429000000

ASSEMBLY INSTRUCTIONS FOR FV PRESS

Characteristics

FV PRESS fittings are designed for creating water distribution and heating from multilayer pipes FV MULTIPERT-5 and FV MULTIPERT-AL.

FV PRESS

- A complete range of top brass press fittings for a wide range of applications, even in the most demanding applications such as heating water distribution
- Wide range from diameter from D16 to D32 (according to fitting type)
- Adapters with external or internal thread, eurocone, coupling nut and adapters for copper distribution lines connected by pressing or soldering guarantee easy connection to any other distribution systems
- Various types of elbows, digressions, unambiguous T-pieces aswell with reduction and elbows for connecting the radiator form a complete system for easy implementation of heating distribution
- Various wall elbows and continuous wall panels with threaded connections for easy connection of water distribution systems to fixtures

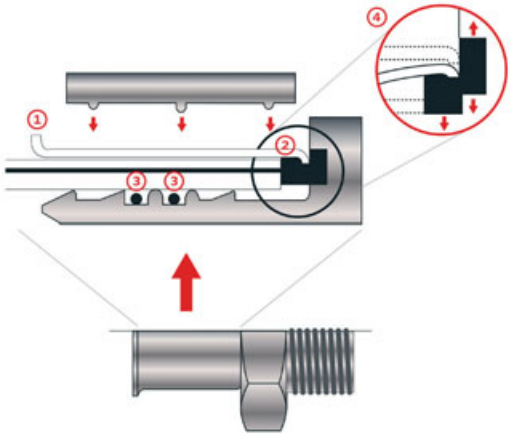
CONNECTION WITH FV PRESS FITTINGS

FV PRESS fittings are in principle based on the perfect sealing of the press-fit connection by means of specially shaped grooves, rubber O-rings and a positioning bearing of the cuff.

Picture no.1: The stainless steel cuff no. 1 is mounted in a positioning bearing no. 2, which adapts to the shape of the pressing jaw during pressing and its connection with the fitting remains resistant to moisture penetration (from plaster or condensate). The two O-ring seals no.3 ensure a perfect sealing of the inner space of the fitting against pressurized water. The inner space of the fitting is thus protected from moisture, which can successfully prevent possible corrosion of the Al layer on the cut of multilayer pipes.

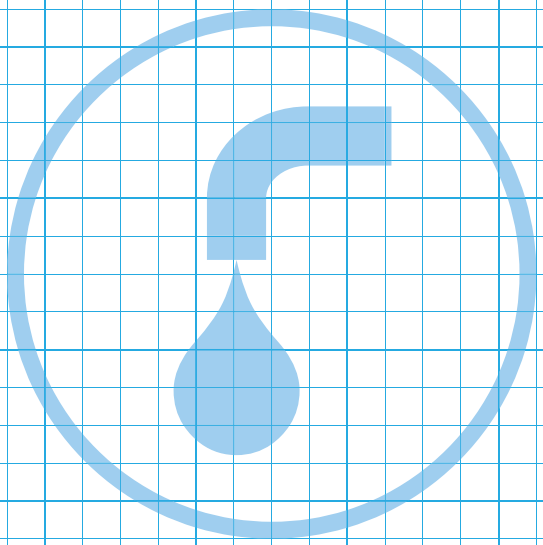
Perfect pressing of the joint no.4 is guaranteed by the Autolock system, which prevents the jaws of the pressing attachments from moving away before the pressing is completed. Fittings of the FV PRESS series meet the strictest requirements for ensuring tightness and health safety.

Picture no.1:



Standard press jaws of the following types are used for pressing FV PRESS fittings:

16 × 2.0	=	TH, U
20 × 2.0	=	TH, U
26 × 3.0	=	TH
32 × 3.0	=	TH, U



A unique invisible system for cooling and heating

COMFORT

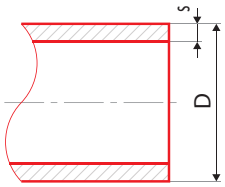
- **FV THERM (heating)**
  - System pipes
  - System floor panels
  - Manifolds and boxes
  - Accessories
  - Assembly instructions for floor heating
  - Assembly instructions for dry system
- **FV CLIMA (cooling)**
  - System pipes
  - System ceiling/wall panels
  - Distributors
  - Fittings
  - Accessories
  - Assembly instructions for cooling

SYSTEM PIPES FOR FLOOR HEATING

FV MULTIPERT-5

System: **COMFORT**
Material: PE-RT/EVOH/PE-RT
Standard: EN ISO 22391, DIN 4726

Note: High-quality system pipes made of PE-RT type II for floor, wall or ceiling heating or cooling, connections to radiators and fan coils. Five-layer construction means long service life and perfect oxygen barrier sealing made of EVOH. Tmax 95 °C.

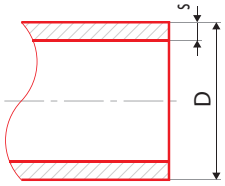


						#	D [mm]	s [mm]	l [mm]
8 × 1.0	m	fólie	600	0.06	0.2	AA120008600	8	1.0	600
10 × 1.3	m	fólie	500	0.040	0.297	AA120010500	10	1.3	500
12 × 1.5	m	fólie	300	0.07	0.452	AA120012300	12	1.5	300
14 × 1.8	m	fólie	300	0.076	0.416	AA120014300	14	1.8	300
14 × 1.8	m	fólie	500	0.07	0.61	AA120014500	14	1.8	500
16 × 2.0	m	fólie	200	0.09	0.8	AA120016200	16	2.0	200
16 × 2.0	m	fólie	500	0.09	0.8	AA120016500	16	2.0	500
17 × 2.0	m	fólie	200	0.102	0.91	AA120017200	17	2.0	200
17 × 2.0	m	fólie	500	0.91	1.018	AA120017500	17	2.0	500
18 × 2.0	m	fólie	200	0.108	1.018	AA120018200	18	2.0	200
18 × 2.0	m	fólie	500	0.108	1.018	AA120018500	18	2.0	500
20 × 2.0	m	fólie	200	0.117	1.257	AA120020200	20	2.0	200
20 × 2.0	m	fólie	500	0.117	1.257	AA120020500	20	2.0	500

FV MULTIPERT-AL

System: **COMFORT**
Material: PE-RT/AL/PE-RT
Standard: ČSN EN ISO 21003, DIN 4726

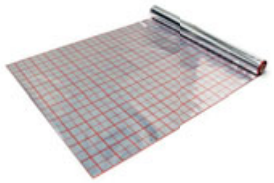
Note: Premium system pipes made of PE-RT/AL/PE-RT for cold and hot water and heating in the most demanding conditions. With bending memory and high toughness. Five-layer construction with longitudinally welded aluminium layer. Tmax 95 °C.



						#	D [mm]	s [mm]	l [mm]
16 × 2.0	m	200		0.105	0.60	AA130016200	16	2.0	200
16 × 2.0	m	400		0.105	0.60	AA130016400	16	2.0	400
20 × 2.0	m	200		0.148	0.31	AA130020200	20	2.0	200

SYSTEM FLOOR PANELS

FV system foil with grid



System: **COMFORT**
Material: EPS/AL
Standard: –

Note: System reflective foil with a grid of 5×5 cm for underfloor heating. For easy attachment of pipes using clips. The film protects the EPS floor boards against the penetration of moisture and the screed itself during the creation of the floor. Tear resistance, covering vapor barrier layer for underfloor heating and also functioning as a separation film.

						#	for Ø D [mm]	net area [m²/pc]	load capacity [kN / m²]
1.02 m × 50 m × 0.105 mm	pcs	50		2.53	2.5	AA900001000	16–20	1	3.5

FV EPS insulated mounting roll

System: **COMFORT**
Material: EPS
Standard: EN 13163

Note: Thermal and sound insulation according to DIN EN 13163 (WLS 045) with anchor laminated PP fabric with a printed 5 cm grid for easy fixing of original tacker clips and with an 18 mm foil overlap on the longer side of the roll.

						#	for Ø D	spacing [mm]	net area [m²/pc]	load capacity [kN / m²]	[W/m.K]
1 m × 10 m × 30 mm	m²	10		0.6	36.18	AA900010030	14–20	50	1.00	4	0.04

FV NOP UNI system panel

System: **COMFORT**
Material: PS
Standard: EN 13163

Note: Universal system board made of durable, deep-drawn PS film formed into a pile shape. Suitable for laying system heating pipes with diameters of 14–20 mm. It has a hem for easy connection of another board and a spacing of 75 mm. The system board for underfloor heating allows quick and easy installation with minimal cutting.

						#	for Ø D	spacing [mm]	net area [m²/pc]	load capacity [kN / m²]
1275 × 975 × 23 mm	pcs	18		1.31	18.20	AA901001000	14–20	75/38	1.08	without limitation

FV NOP SOLO system panel

System: **COMFORT**
Material: PS
Standard: EN 13163

Note: Universal system board made of durable, deep-drawn PS film formed into a pile shape. Suitable for laying system heating pipes with diameters of 14–18 mm. It has a hem for easy connection of another plate. The system floor heating plate allows quick and easy installation with minimal cutting.

						#	for Ø D	spacing [mm]	net area [m²/pc]
1400 × 800 × 21 mm	pcs	14		0.975	18.2	AA902003000	16–18	50/50	1.12

FV NOP ISO system panel with 11 mm insulation

System: **COMFORT**
Material: EPS/PS
Standard: EN 13163

Note: Combined thermal insulation made of 11 mm EPS with a layer of durable deep-drawn PS foil formed into a pile shape. Suitable for laying system heating pipes with diameters of 16, 17, 18 mm. It has a hem for easy connection of another plate. The system floor heating plate allows quick and easy installation with minimal cutting.

						#	for Ø D	spacing [mm]	net area [m²/pc]	[W/m.K]
1400 × 800 × 11 mm	pcs	14		1.31	21.84	AA902002011	16–18	50	1.12	0.035

FV NOP ISO PLUS system panel with 30 mm insulation

System: **COMFORT**
Material: EPS/PS
Standard: EN 13163

Note: Combined thermal and thermal insulation made of EPS 30 mm with a layer of durable deep-drawn PS film formed into a pile shape. Suitable for laying system heating pipes with diameters of 16, 17, 18 mm. It has a hem for easy connection of another plate. The system floor heating plate allows quick and easy installation with minimal cutting.

					#	for Ø D	spacing [mm]	net area [m²/pc]	[W/m.K]
1400 × 800 × 30 mm	pcs	8	1.75	57.08	AA902001030	16–18	50	1.12	0.035

FV DR system panel with 30 mm insulation for dry construction

System: **COMFORT**
Material: EPS/AL
Standard: EN 13163

Note: Special system board for dry floor construction. 30 mm EPS board with a layer of laminated AL foil and grooves for laying system heating pipes with a diameter of 16 mm. The underfloor heating system board enables quick and simple installation with minimal cutting. Connection with DK or DKS boards.

						#	for Ø D	spacing [mm]	net area [m²/pc]	load capacity [kN / m²]	[W/m.K]
960 × 480 × 30 mm	pcs	17	1	0.476	16.58	AA903000960	16	120/240	0.4608	5	0.035

FV DK end system panel with 30 mm insulation for dry construction

System: **COMFORT**
Material: EPS/AL
Standard: EN 13163

Note: Special end system board for dry floor construction. 30 mm EPS board with a layer of laminated AL foil and grooves for laying system heating pipes with a diameter of 16 mm. The underfloor heating system board enables quick and simple installation with minimal cutting. Connection with DR or DKS boards.

						#	for Ø D	spacing [mm]	net area [m²/pc]	load capacity [kN / m²]	[W/m.K]
480 × 240 × 30 mm	pcs	34	1	0.119	4.14	AA903000240	16	120/240	0.1152	5	0.035

FV DKS end system panel with 30 mm insulation for dry construction

System: **COMFORT**
Material: EPS/AL
Standard: EN 13163

Note: Special end system board with groove for dry floor construction. 30 mm EPS board with a layer of laminated AL foil and grooves for laying system heating pipes with a diameter of 16 mm. The underfloor heating system board enables quick and simple installation with minimal cutting. Connection with DR or DK boards.

						#	for Ø D	spacing [mm]	net area [m²/pc]	load capacity [kN / m²]	[W/m.K]
480 × 320 × 30 mm	pcs	34	1	0.158	5.53	AA903000320	16	120/240	0.1536	5	0.035

FV RENO special mat for floor reconstruction

System: **COMFORT**
Material: PS
Standard: EN 13163

Note: A special deep-drawn PS foil board with 16 mm high pile designed for floor renovations associated with the installation of underfloor heating when laying on the original floors. The board is designed for system pipes with diameters of 10 and 12 mm.

						#	for Ø D	spacing [mm]	net area [m²/pc]	load capacity [kN / m²]
1050 × 650 × 16 mm	pcs	16		0.84	11.44	AA904001000	10–12	50/43	0.60	without limitation

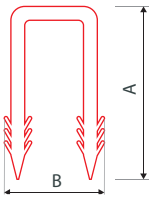
FV clamping rail, universal

System: **COMFORT**
Material: PP
Standard: –

Note: Plastic fixing strip for easy laying of system pipes with height fixing, with adhesive tape for quick fixing to the substrate. Minimum pipe spacing 50 mm, length 1000 mm. Universal for pipe diameters 16–20 mm.

						#	D [mm]	B [mm]	C [mm]
16–20 × 1000 mm	pcs	100		1.168	0.83	AA905003000	16–20	40	28

FV staple for clamping rail, universal

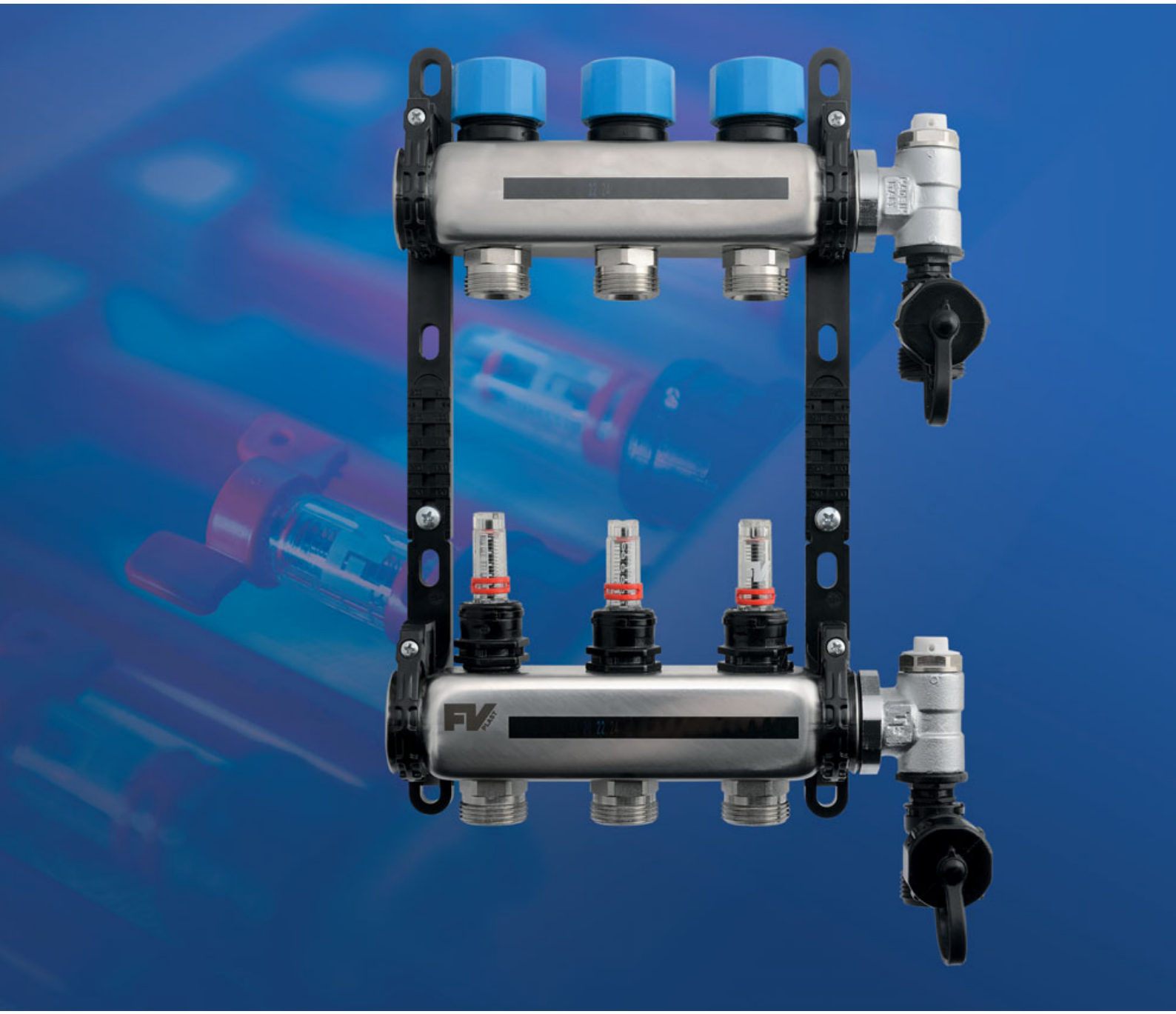


System: **COMFORT**
Material: PP
Standard: –

Note: Clip for anchoring the universal fixing rail. The clip securely holds the fixing rail in EPS boards even when used in dusty environments.

						#	A [mm]	B [mm]
58 × 27 mm	pcs	200		0.002	0.009	AA909000058	58	27

MANIFOLDS SUITABLE FOR COMFORT SYSTEMS



FOR HEATING AND COOLING

LIGHTNING ASSEMBLY

DOES NOT CORRODE

MAXIMUM TEMPERATURE 90 °C

COMFORT MANIFOLDS

Complete stainless steel and plastic manifolds with flow meters for COMFORT underfloor heating and ceiling cooling systems

INOX

1 "STAINLESS STEEL DISTRIBUTOR INOX FOR UNDERFLOOR HEATING WITH EUROCONUS
Applicable pipe diameters: **d10 × 1.3 mm – d20 × 2.0 mm**
Applicable liquids: **water or glycol solutions up to a maximum concentration of 50%**
Operating temperature: **5–55 °C**
Maximum temperature: **60 °C**
The operating pressure: **0–6 bar**
Maximum pressure **10 bar**
Distance between outlets / valves: **50 mm**
Range of adjustable holders: **210–273 mm**
Cabinet depth: **> 76 mm**

COMFORT

See page 70 for the complete range of manifolds.

MANIFOLDS AND BOXES

FV manifold with Eurocone INOX

System: **COMFORT**
Material: stainless steel
Standard: –

Note: The manifold body is made of high-quality stainless-steel profiles with a pitch of 50 mm and a connection to the 1" AG supply. With excellent temperature resistance, max 90 °C at 3 bar pressure and minimum thermal expansion. For heating liquids such as water or water treated with glycol with a max. concentration of 50 %. Operating temperature from 5 to 55 °C. Working pressure 0–6 bar. The heating pipe of the circuits is connected to the manifold by means of a Eurocone M 3/4" from D10 to D20 mm diameter. Dry flow meters are fitted at the inlet to the circuits, with a scale of 0–5 l/min. On the return side of the circuits there are shut-off valves with the possibility of connecting a thermostatic actuator M30 × 1.5 mm. Complete with adjustable brackets with spacing from 200 to 250 mm. The total thickness of the manifold with brackets for wall or cabinet mounting is 76 mm.

						#	Number of circuits	width B [mm]
192 mm	pcs	1	1	1.58	8.4	AA906001002	2	192
242 mm	pcs	1	1	1.93	8.4	AA906001003	3	242
292 mm	pcs	1	1	2.28	8.4	AA906001004	4	292
342 mm	pcs	1	1	2.63	9.6	AA906001005	5	342
392 mm	pcs	1	1	2.98	10.7	AA906001006	6	392
442 mm	pcs	1	1	3.33	11.9	AA906001007	7	442
492 mm	pcs	1	1	3.68	11.9	AA906001008	8	492
542 mm	pcs	1	1	4.03	14.1	AA906001009	9	542
592 mm	pcs	1	1	4.38	15.3	AA906001010	10	592
642 mm	pcs	1	1	4.73	16.4	AA906001011	11	642
692 mm	pcs	1	1	5.08	17.6	AA906001012	12	692
742 mm	pcs	1	1	5.43	18.7	AA906001013	13	742
792 mm	pcs	1	1	5.78	19.8	AA906001014	14	792
842 mm	pcs	1	1	6.13	21.0	AA906001015	15	842

FV manifold cabinet, above-plaster

System: **COMFORT**
Material: steel
Standard: –

Note: Manifold cabinet, above-plaster. Made of sheet steel, white powder coating. Rear wall with fixing bracket for mounting the manifold and electrical accessories. Enclosure depth 145 mm, lockable/removable door.

						#
450 mm	pcs	1	1	6	41	AA907000046
585 mm	pcs	1	1	6.5	64.8	AA907000058
725 mm	pcs	1	1	8	79.39	AA907000072
980 mm	pcs	1	1	10	102.18	AA907000081
980 mm	pcs	1	1	10	102.18	AA907000098
1115 mm	pcs	1	1	11	115.07	AA907000111

FV manifold cabinet, under-plaster

System: **COMFORT**
Material: steel
Standard: –

Note: Manifold cabinet, under-plaster. Made of sheet steel, white powder coating. Rear wall with fixing bracket for mounting the manifold and electrical accessories. Enclosure depth 145 mm, lockable/removable door.

						#
470 mm	pcs	1	1	6.4	43	AA908000047
600 mm	pcs	1	1	7.2	57	AA908000060
750 mm	pcs	1	1	8.4	69	AA908000075
830 mm	pcs	1	1	9.5	73	AA908000084
1000 mm	pcs	1	1	11	91	AA908000100
1095 mm	pcs	1	1	11.2	93.5	AA908000101

ACCESSORIES

FV tacker staple

System: **COMFORT**
Material: PP
Standard: –

Note: High quality tacker clamp for fixing d15–20 mm pipe. The PP clamp is equipped with effective hooks which, together with the system plate, ensure easy and reliable fixing of 15–20 mm system pipe. The clamps are welded together in trays of 50 pcs and packed in a carton of 300 pcs.

						#
40	pcs	300	1	0.0018	0.010	AA909000040
50	pcs	250	1	0.0021	0.013	AA909000050

FV edge strip

System: **COMFORT**
Material: PE
Standard: –

Note: Edge insulation strip 150 mm. Consists of 8 mm thick PE foam film 150 mm high with 280 mm PE foil glued on. Has a self-adhesive tape on the back for easier fixing to the wall. Suitable for cementitious and self-levelling screeds.

						#
150 mm	m	50	50	1.00	15.00	AA910150050

FV PE protector tubing

System: **COMFORT**
Material: PE
Standard: –

Note: PE protection pipe for protection of system pipes when crossing the expansion joint and outlets at the manifold.

					#
25 mm × 50 m	pcs	50 m	2.00	0.35	AA911025050

FV joint profile

System: **COMFORT**
Material: PE
Standard: –

Note: Joint profile made of closed cell polyethylene foam. Used for perfect spatial separation of expansion joints, creates permanently elastic joints in concrete and anhydrite floors. Fixing self-adhesive layer on the underside of the inverted T-profile allows for easy and quick installation. The width of the expansion joint created is 8 mm, the height 100 mm. The length of one piece is 2 m.

						#	A [mm]	B [mm]	C [mm]
100 × 2000 mm	pcs	220	2	0.07	2.236	AA912100200	100	40	8

FV plastic pipe bend support

System: **COMFORT**
Material: nylon + C
Standard: –

Note: Fixed 90° fixing bend for protecting and fixing system pipes when passing through the ceiling and the inlet to the underfloor heating manifold. Universal for sizes 14–18 mm and 20–22 mm.

						#	D [mm]	Length [mm]
14–18	pcs	400	1	0.04	0.26	AA913014018	14–18	160
20–22	pcs	400	1	0.06	0.55	AA913020022	20–22	160

FV thermal drive for manifold FV NC – 230 V

System: **COMFORT**
Material: plastic
Standard: –

Note: Ensures control of the valves of individual branches of the manifold. Connection: coupling nut M30 × 1.5. Variant: NC (no current closed); Protection: IP65. Power consumption 2.5 W / 230 V.

						#	
	pcs	50	1	0.14	0.30	AA916000000	230 V

FV room thermostat

System: **COMFORT**
Material:
Standard: –

Note: Electronic 230 V temperature controller for individual rooms in combination with thermo drives. Accessories: adapter for installation above-plaster. Operating range: 5–30 °C. Up to 15 thermo drives can be controlled.

					#	
76 × 76 × 32	pcs	1	0.20	0.10	AA917000000	230 V

FV electronic manifold

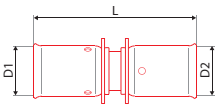
System: **COMFORT**
Material:
Standard: –

Note: Electronic manifold for DIN rail for connecting up to 24 thermo drives and 6 room thermostats. LED signalling, silent switching.

					#	
300 × 110 × 50	pcs	1	0.40	3.00	AA918000000	24–230 V

FV THM press coupling

System: **COMFORT**
Material:
Standard: –
Note: Crimp coupling for connecting floor heating pipes.



						#
16 × 2.0	pcs	50	10	0.10	0.07	AA921116000
17 × 2.0	pcs	50	10	0.12	0.09	AA921117000
18 × 2.0	pcs	50	10	0.12	0.09	AA921118000
20 × 2.0	pcs	50	10	0.14	0.12	AA921120000

FV compression fitting for manifold (Eurocone 3/4")

System: **COMFORT**
Material:
Standard: –
Note: MS-fitting for connecting MULTIPERT-5 system pipes d15–20 mm to manifolds. It consists of a MS-nut 3/4" IG, a clamp ring and an O-ring.

						#
16 × 2.0	pcs		10	0.10	0.03	AA920016000
17 × 2.0	pcs		10	0.10	0.03	AA920017000
18 × 2.0	pcs		10	0.0738	0.03	AA920018000
20 × 2.0	pcs		10	0.10	0.03	AA920020000

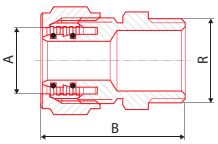
FV compression coupling

System: **COMFORT**
Material:
Standard: –
Note: Compact coupling. Consists of an MS-double fitting and 2 clamp fittings for connecting the system pipe.

						#
16 × 2.0	pcs		10	0.10	0.07	AA921016000
17 × 2.0	pcs		10	0.10	0.07	AA921017000
18 × 2.0	pcs		10	0.10	0.07	AA921018000
20 × 2.0	pcs		10	0.10	0.07	AA921020000

FV reducing sleeve male 3/4"

System: **COMFORT**
Material: brass - nickel-plated
Standard: –
Note: MS-fitting for connecting MULTIPERT-AL system pipes to fittings with Eurokonus 3/4" female thread.

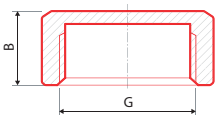


						#	A	B [mm]	R
15 × 3/4"	pcs	10	1	0.085	0.135	AA924015034	15	38	3/4"
16 × 3/4"	pcs	10	1	0.088	0.135	AA924016034	16	40	3/4"
17 × 3/4"	pcs	10	1	0.090	0.135	AA924017034	17	40	3/4"
20 × 3/4"	pcs	10	1	0.111	0.135	AA924020034	20	43	3/4"

FV manifold plug female 3/4"

System: **COMFORT**
Material: brass - nickel-plated
Standard: –

Note: For closing an unused circuit on the floor heating manifold. Possibility of creating a reserve for future expansion of the heated space. Application range min. 0–120 °C.

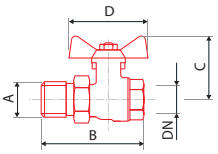


						#	A	B [mm]
3/4"	pcs		1	0.034	0.027	AA925020034	3/4"	12

FV ball valve 1" with int/ext thread

System: **COMFORT**
Material: Forged brass body according to EN 12165, nickel-plated.
Standard: ČSN EN ISO 228

Note: Ball valve with 1" connection and colour-coded handle in bow tie design. Application range from –10 °C to +95 °C.

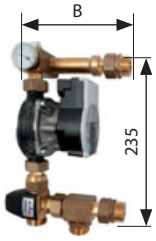


						#	#	A [mm]	B [mm]	C [mm]	D [mm]
1"	pcs	72	6	0.53	0.36	AA926002001	red	1"	88	57	67

FV mixing set

System: **COMFORT**
Material: Brass
Standard: –

Note: Mixing set for underfloor heating with a heating surface of up to 180 m². The kit includes a thermoregulating valve, a thermostatic head with a temperature range of 20–65 °C, a circulation pump Wilo Para RS 15/6, a non–return valve, a regulating valve, an electric pump control unit, a thermometer. Connection 1".



						#	B [mm]
	pcs	1		4.5	12.7	AA906100180	194

FV tacker – fixing gun

System: **COMFORT**
Material:
Standard: –

Note: The tacker 15–20 is a special fixing tool for fixing system pipe to the EPS system roll plates. Height adjustable, for fixing system tubes using original tacker fixing clips.

					#
15–20	pcs	1	7.00	15.00	AA922000000

FV tacker – fixing gun, plastic

System: **COMFORT**
Material:
Standard: –

Note: The tacker 15–20 is a special fixing tool for fixing system pipe to the EPS system roll plates. Height adjustable, for fixing system tubes using original tacker fixing clips.

					#
15–20	pcs	1	1.75	22.30	AA922000001

FV horizontal decoiler

System: **COMFORT**
Material: Fe - galvanized
Standard: –

Note: The durable material of the decoiler guarantees long-term maintenance-free operation. Assembly and disassembly does not require the use of additional tools. Use of the decoiler during the installation of system pipes significantly speeds up the installation. The decoiler is designed for 14–20 mm pipe, max. load 52 kg and max. wheel length 600 m.

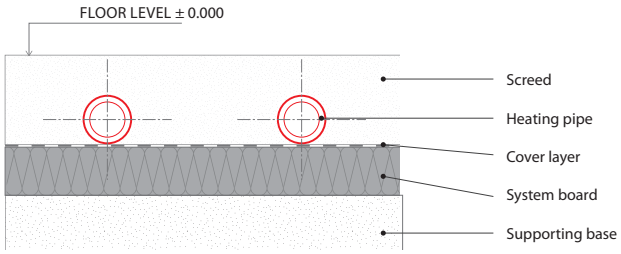
					#	Ø [mm]	height [mm]
14–20	pcs	1	16.00	45.29	AA923001000	1140	548

ASSEMBLY INSTRUCTIONS FOR UNDERFLOOR HEATING

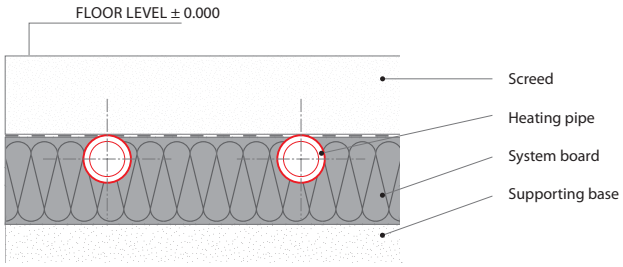
The underfloor heating system is designed for heating apartments, family houses, administrative and shopping centers and industrial buildings. The basis is high-quality FV MULTIPERT-5 pipes with an oxygen barrier made of EVOH, specially designed for underfloor heating, the use of which for these purposes is the most economical. Top-quality FV MULTIPERT-AL pipes with a longitudinally welded aluminum layer can also be used.

Due to the arrangement of the heating pipes on the insulation layer, the underfloor heating system is classified as a wet laying system in design group A according to DIN 18560-2. See picture no. 1, 2.

Picture no. 1: Construction type A – Systems with screed pipes



Picture no. 2: Construction type B – Systems with pipes under screed



1. FIELD SIZES AND EXPANSION JOINTS

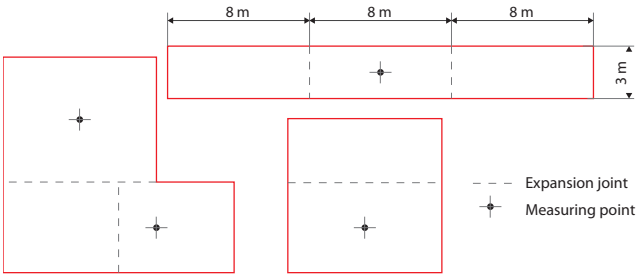
The screed is implemented in accordance with DIN 18560-1. Additional screeds may be used for better processing of cement screeds. The grain size of the screed sand should be between 0–8 mm. Screed fields should not exceed 40 m² with a joint ratio of 1:1 or 1:2. Arrangement of expansion fields and joints see picture. no. 3. For areas below 40 m², expansion joints should be used if the side length exceeds 8 m or protruding components (corners, pillars, chimneys) limit the shape of the screed plate.

Expansion joints may only be crossed by a connecting line in one level by means of a protective pipe with a length of min. 200 mm on each side of the joint.

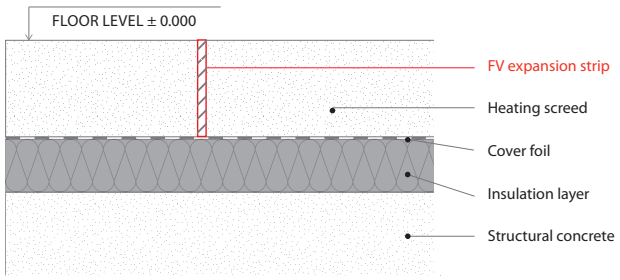
For every 200 m² of screed area, three measuring points must be taken into account to measure the residual moisture. The design of the heating circuits must correspond to the size and shape of the screed plate (see picture. no. 3). In the case of anhydrite cast screeds, the arrangement of the joints must be consulted with the screed manufacturer.

It is necessary to make joints in the screed (movement joints) and in the final floor covering above the expansion joints of the building. In addition, the screed must be separated from the vertical components by joints (edge joints). If reactive joints are arranged in the screeds, they may be cut to a maximum of one third of the screed thickness. A joint plan must be drawn up for the arrangement of the joints, which shows the type and arrangement of the joints. The joint plan is prepared by the construction designer and submitted as part of the performance descriptions of the implementing company.

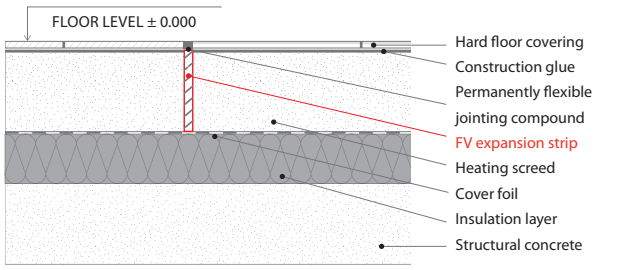
Picture no. 3: Arrangement of fields and expansion joints



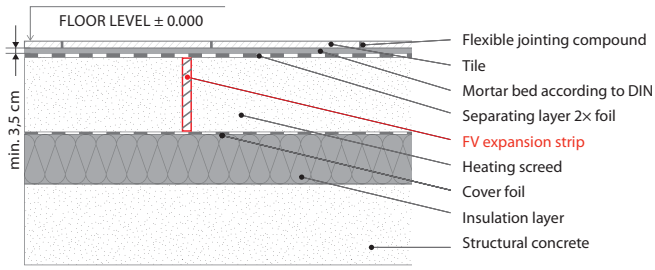
Picture no. 4: Expansion joint of heating screed



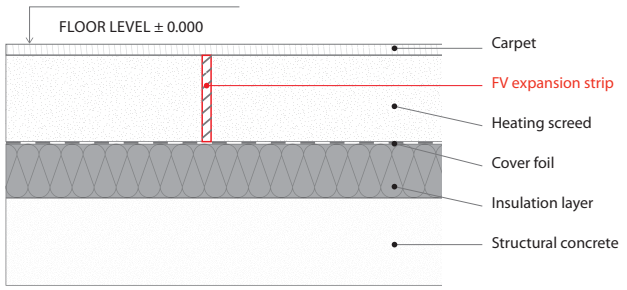
Picture no. 5: Expansion joint of heating screed when laying hard floor coverings (tiles, stone floor, laminate floor)



Picture no. 6: Expansion joint of heating screed when laying hard floor coverings with separating layer (tiles, stone floor, laminate floor)



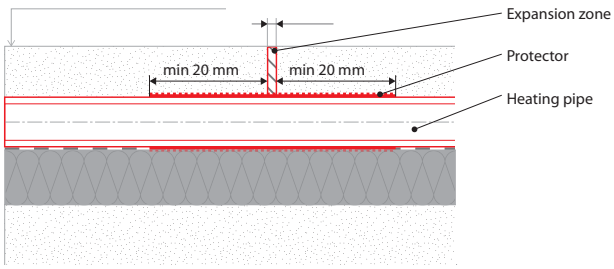
Picture no. 7: Expansion joint of heating screed when laying soft floor coverings (PVC, linoleum, carpet)



Expansion joints are made according to the project of the joint plan. If a construction expansion joint is made, it is necessary to make it without interruption even in the place of underfloor heating. If a hard floor covering is used, it is necessary to add the expansion joint in this layer as well (see picture no. 5).

The heating pipe must be protected by FV PE protector when crossing risk areas (expansion joints, door transitions, passages through walls).

Only the supply and return pipes to the individual circuits, not the circuit pipes, can be led through the expansion joint in the protector.. The minimum length of the pipe protector (see picture no. 8) is 20 cm on each side of the expansion joint. The minimum width of the expansion joint is 8 mm.



Picture no. 8: Protection of the heating pipe when passing through the expansion zone of the FV PE protector

2. PIPES FOR UNDERFLOOR HEATING

The FV MULTIPERT-5 pipes are among the high-quality, inspected and certified products. After delivery to the construction site, plastic pipes must be stored, processed and manipulated in such a way that:

- were protected from any damage
- the heating pipes have not been exposed to direct sunlight.
- storage time in unprotected storage did not exceed 3 months.
- were stored on a flat surface that shows no sharp edges.
- were protected from oils, fats, paints and prolonged exposure to sunlight.

Polyethylene heating pipes FV MULTIPERT-5

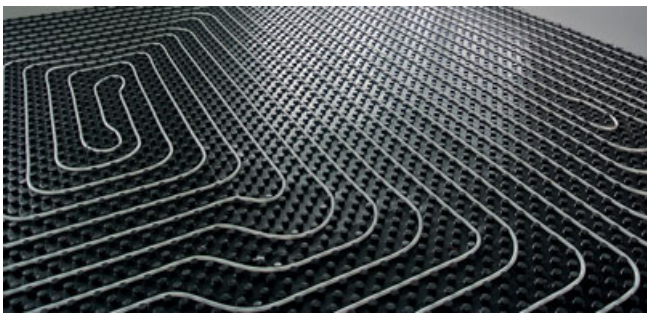
Continuous operating temperature:	+ 70 °C
Max. short-term temperature load:	+90 °C (max. 2 years)
The operating pressure:	4 bar
Meets all the requirements of ISO 10508 for class 4 + 5	
Minimum bending radius	5 × d (d = outer pipe diameter)
Installation temperature:	from –5 °C to +30 °C
DIN Registration Number:	3V 204 PE-RT

Five-layer highly flexible system pipe made of PE-RT with increased temperature resistance according to EN ISO 22391, with oxygen barrier according to DIN 4726, with increased protection against mechanical damage during transport and manipulation on the construction site. Packaging of 200 m in a strapped bundle in a cardboard package, or after 400 m in a strapped bundle in a protective foil.

Oxygen permeability at 40 °C is well below the limit specified in DIN 4726. Using the HP method, the EVOH barrier layer is inseparably connected to the base pipe.

2.1. UNDERFLOOR HEATING INSTALLATION PROCEDURE

Electrical and sanitary installations, interior plastering and window work must be completed before insulation and surface heating. For plasters, it is necessary that they are stretched directly to the supporting base of the floor. Before starting installation work on the underfloor heating system, the specialist must check the flatness of the raw floor using a meter line. The maximum height tolerance is 1 cm for the entire area of the installed room. Meter lines are usually marked in the section of doorways during construction. They are usually marked with a circle or by other method. Dimensional tolerances must be observed in accordance with DIN 18202 (tolerances in building construction). The flatness must be checked before laying the insulation. Any major inequalities must be removed / leveled. Remains of plaster and other impurities must be removed from the floor.



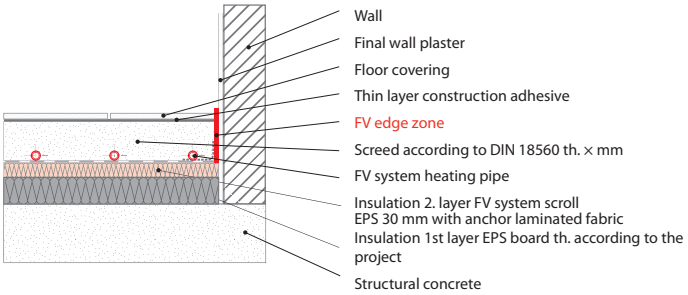
Picture no. 9: Underfloor heating piping

Floor surfaces bordering the ground must be provided with insulation against moisture, according to DIN 18195 (building insulation). The definition of the exact construction insulation is specified by the designer or architect. The craftsman in charge of laying the insulation must check the suitability of the seal and communicate any concerns with the waterproofing to the construction management in writing. If bitumen seals, eg bituminous strips, are installed, it is necessary to lay an intermediate layer of 0.1 mm thick polyethylene foil before laying the insulation. The foil is laid freely on the seal. Pipes laid on the floor must be properly fastened and secured against slipping or floating. To achieve a proper floor structure, it is necessary to lay leveling insulation. An additional level of insulation can then be laid on the lower insulation. Compensating insulation may only be made of "hard" insulation (EPS-DEO, PUR, etc.). For laying insulation from several layers, the joints of individual layers must not overlap, but alternate, see. picture no. 11.

3.1. INSTALLATION OF THE FV EDGE INSULATION STRIP

The edge insulation strip must be carefully made on all vertical building components such as columns, door openings, fireplace, elevator shaft, etc. In the case of thermal insulation of a building consisting of several layers, the edge strip can be installed before the last insulation layer is laid. The attached foil apron of the edge strip must be laid in such a way that the edge joint between the thermal and impact insulation is completely covered and the screed is prevented from flowing, resp. water. The edge joints must reach from the supporting base to the roof surface and allow the screeds to move at least 5 mm. The edge strip must be secured against position changes during screed installation. The insulating edge strip, which is located above the screed board after pouring, may only be cut off after the top floor layer has been laid, resp. for textile and elastic coverings only after the trowel has hardened. The reason is also to prevent acoustic bridges and construction damage.

All grouting and troweling work on the floor and the walls adjacent to the floor must be completed by cutting off the protruding part of the edge strip. After cutting off the protruding part of the edge strip, the floor skirting boards are installed.



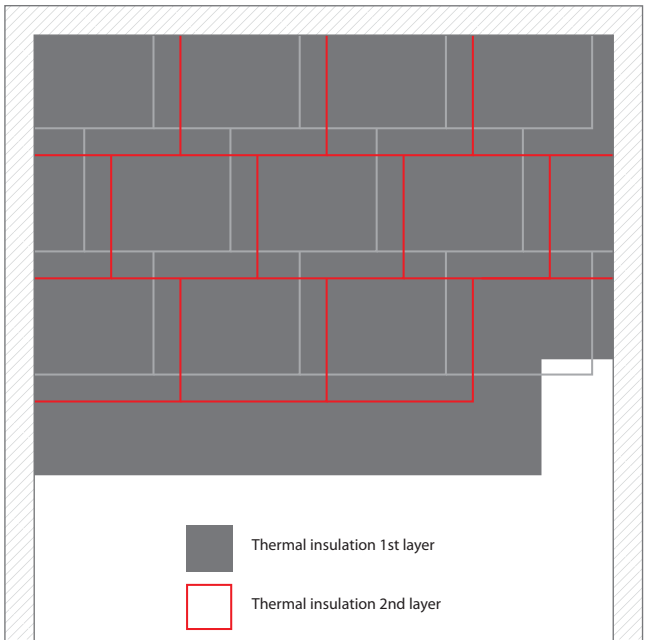
Picture no. 10: Fitting the FV edge strip

3.2. INSTALLATION OF SYSTEM BOARDS

The choice of system boards depends on the requirements for thermal and impact insulation according to the valid ENEV / DIN4109 / DIN4108 standards. The insulation layers and system boards are laid on a flat, load-bearing surface. If installation or electrical cables are laid on the raw floor, these must be insulated and a place must be created for them in the insulation under the underfloor heating.

The first layer of multilayer insulation must be modified so that a full-area substrate and a continuous closed area are created for the EPS / system board. In the case of two-layer laying, the layers must be installed with offset joints. The multilayer "sandwich" foil on the upper side of the system rolls / boards represents the covering layer of the insulating layer according to DIN 18560.

The one-sided overlap of the foil serves to cover the joints. The front joints must always be glued with FV self-adhesive tape. Filler parts that are inserted without foil overlap must be glued around the perimeter. Before using the poured screed, all joints must be glued very carefully to prevent the screed from leaking, resp. distribution water. It is necessary to interrupt the arrangement of insulating materials on the expansion joints of buildings and maintain the expansion joint. The maximum permissible floor installation height must be observed in any case.



Picture no. 11 Laying more insulation layers under underfloor heating

3.3. INSTALLATION OF THE UNDERFLOOR HEATING MANIFOLD CABINET

Floor circuit manifolds are installed in cabinets. In addition to the manifold, the cabinet contains shut-off ball valves and valves for filling and venting the system. Furthermore, components for control or pump and mixing are located in the cabinet. The cabinet is installed to the required height from the level of the final floor before mounting the circuits. In the case of a sufficient wall thickness on which the manifold box is placed, it is possible to use a flush-mounted FV cabinet. In case of insufficient thickness, the FV cabinet is mounted on the wall.

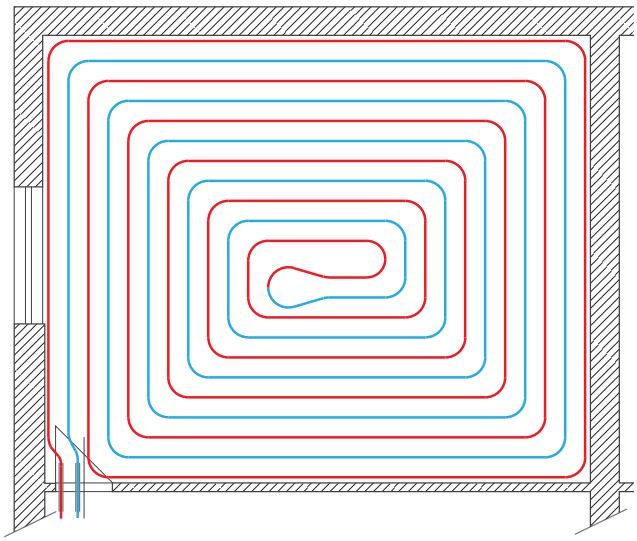
3.4. LAYING OF SYSTEM HEATING PIPES

Pipe laying begins by attaching the heating pipes to the supply manifold. When tightening the fittings (size 30), a mating piece (size 24) must always be held on the manifold. It is also necessary to observe the maximum tightening torque of 30N. The ends of the pipes must be separated at right angles without burrs. The place of transition of the pipes from the floor to the wall is protected by inserting the pipe into the FV click guide elbow, which allows to fix the bend in the range from 0 - 90 °, or a high-quality FV fixing plastic bend.

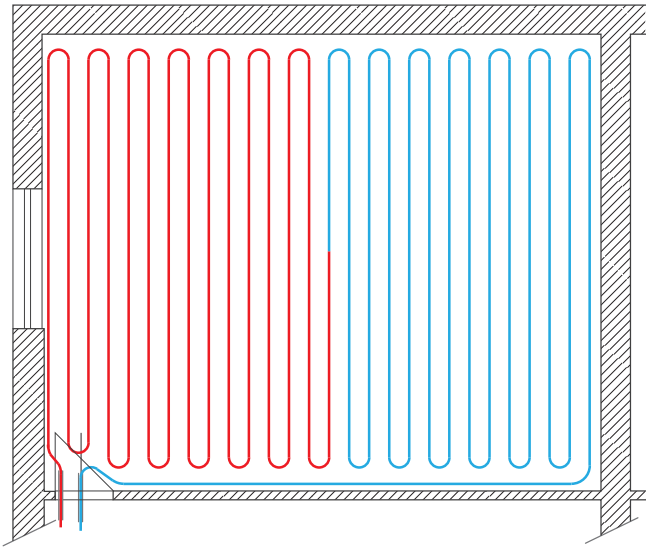
The pipes are attached to the surface of the EPS FV system roll using the FV tacker stapling needles and the original FV tacker system stapler. Tacker FV clamps are placed at intervals of approx. 50 cm at the straight part of the heating pipes; when changing direction, the spacing must be reduced to approx. 30 cm. Alternatively, mounting rails can be placed on the insulation and the pipes placed in them.

When laying, the following distances of the first pipe must be observed for:

- vertical components: 50 mm
- elevators, shafts, chimneys, fireplaces: 200 mm



Picture no. 12: Spiral piping

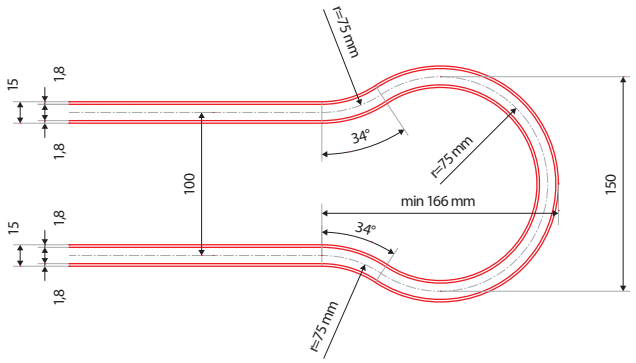


Picture no. 13: Meandering piping

The minimum bending radius 5 × d (pipe outer diameter) must not be reduced in accordance with DIN 5. The heating pipes can be laid in a spiral or meander shape.

Due to the more even heat distribution, spiral laying is to be preferred. With this type of installation, we achieve a constant temperature profile in the floor. In places that are more cooled (north wall, wall with a large window, or glass wall, etc.), a pipe with a smaller spacing is laid than in the residential area, and an edge zone is created. The edge zone can be part of a circuit or form a separate circuit.

When laying the return loops in the middle of the heating circuit, the minimum dimensions of the corresponding bending radius according to DIN 4726 s × d (d = outer diameter of the heating pipe) must be observed. The minimum bending radius for 15 × 1.8 mm pipes is 75 mm and for 17 × 2.0 mm pipes it is 85 mm. In the case of a sharp bend, proceed as shown in picture no. 14, for a 17 × 2.0 mm pipe, r = 17 × 5 = 85 mm, a loop length of 197 mm and a width of 170 mm.

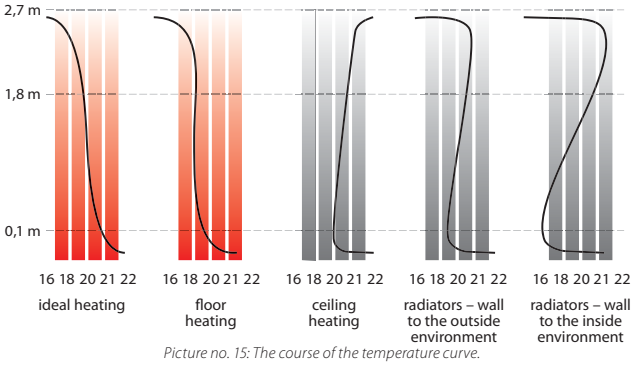


Picture no. 14:

Fractures (sharp bends that occur if the minimum bend radius of the pipe is not observed) must be removed. Couplings can only be mounted on straight pipe routes. The edge pipe is laid approx. 5 cm from the edge strip and is laid on PE foil, which is part of the edge strip. By fixing the first pipe to the substrate, we ensure that the grout does not flow under the foil.

When repairing the heating pipe or processing the remaining lengths, make sure that the FV compression fitting is located in a straight section of pipe, not in an arc. The FV clamp must be measured and marked in the construction documentation.

FLOOR SURFACE TEMPERATURES



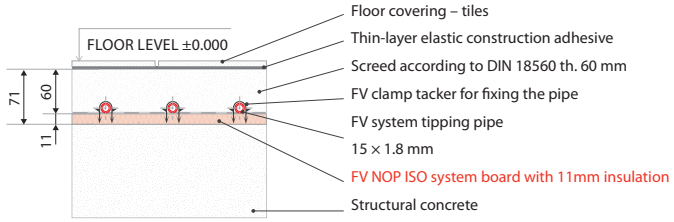
Picture no. 15: The course of the temperature curve. Comparison of "ideal heating" with FV THERM underfloor heating

The appropriate use of the room is decisive for determining the maximum surface temperature. According to DIN EN 1264, the maximum floor surface temperature in the living area must be limited to 29 °C (wet rooms 33 °C / edge zone 35 °C). Surface temperature, resp. the uniformity of the surface temperature of the surface heating is basically determined by the chosen floor covering.

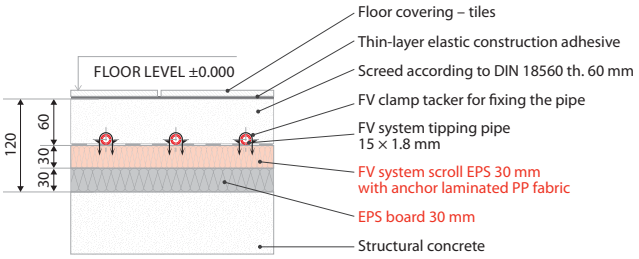
The uniformity of the temperature course is determined by its heat transfer resistance, excessive temperature of the heating means, spacing during the laying of heating pipes and the chosen type of laying.

Living room floor surface temperatures at corresponding outdoor temperatures								
V_2 [°C]	-15	-10	-5	±0	+5	+10	+15	+20
V_1 [°C]~	+29.0	+27.5	+26.0	+25.0	+24.0	+23.0	+21.5	+20.0

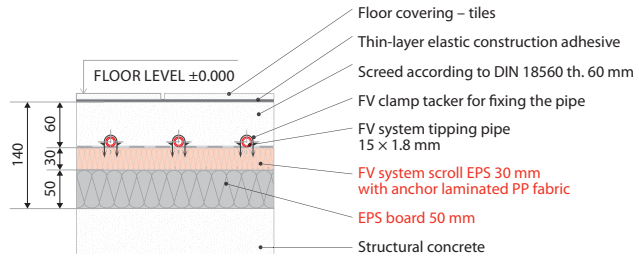
FLOOR COMPOSITIONS WITH UNDERFLOOR HEATING IN THE FV THERM SYSTEM



Picture no. 16: Recommended floor composition above heated rooms according to the recommendations of the ČSN EN 1264 standard thermal insulation resistance R = 0.75 m²K/W



Picture no. 17: Recommended floor composition above heated rooms according to the recommendations of the ČSN EN 1264 standard thermal insulation resistance R = 1.25 m²K/W



Picture no. 18: Recommended floor composition above heated rooms according to the recommendations of the ČSN EN 1264 standard thermal insulation resistance R = 2.00 m²K/W

4. FV UNDERFLOOR HEATING MANIFOLD

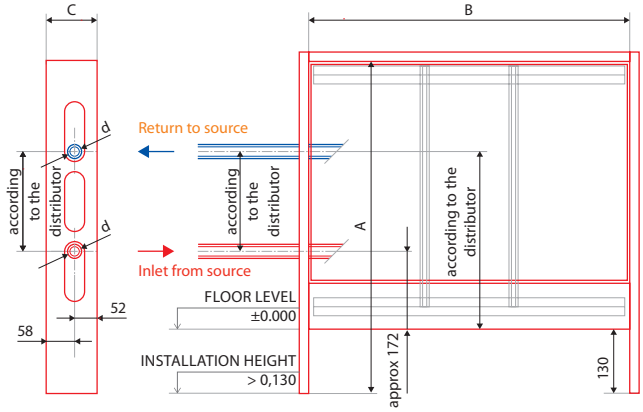
Due to the technical possibilities of regulation, it is recommended to assign a separate heating circuit to each room. If the room has a larger area than can be covered by one circuit, the room is divided into the corresponding number of heating circuits. Circuits longer than 120 m are not permitted. Multiple heating circuits can be part of one expansion unit.

The required heating circuit manifold results from the number of installed heating circuits. The recommended maximum pressure drop of the system (including manifold and connection fittings) is 250 mbar.

The manifold is designed so that it can be installed either on the wall or in the built-in manifold cabinet. The maximum number of circuits connected to one manifold is 12.

Picture no. 19: FV manifold with flow meters

The connection pipe from and to the source is with a 1 "AG connection, optionally from the left or from the right.



Picture no. 20: Inlet and return connection from the side – horizontally into the flush-mounted cabinet

5. LEAK TEST

After the installation work, the device must be professionally filled and the water-tightness checked. The specifications of the VDI 2035 standard (damage prevention in hot water heating systems) must be observed.

All supply and return valves must be connected to the heating circuit switchboard. A hose must be connected to the filling tap from the water source. A hose ending in the drain or outside the house must be connected to the return valve. All circuits must be closed at the beginning of filling. After opening the supply valve, it is necessary to bleed the pipe of the supply switchboard Then open the first supply valve and the first return valve

If the heating circuit is completely filled with water so that no more air comes out at the free end, then the first heating circuit must be closed again. The same procedure must be followed for other heating circuits. At the end of the complete filling and venting process, all filling and draining valves are closed. All supply and return valves must then be opened. The water-filled system must now be subjected to a pressure test in accordance with the requirements of the ČSN EN 1264 standard. The pressure test must be carried out with water to prevent damage to the pipes. The test pressure is twice the operating pressure, but at least 6 bar (according to ČSN EN 1264-4). After two hours, the test pressure must be restored. Any pressure drop is usually due to pipe expansion. The duration of the test is 12 hours. The pressure test is successful if there are no water leaks at any point in the pipes, joints and connections and the test pressure does not drop by more than 0.1 bar per hour. A report must be drawn up on the performance of the pressure test. This protocol must be attached to the construction documentation.

To protect the heating system and safety devices, care must be taken to ensure that the ball valves of the connection set are closed during the pressure test.

6. HYDRAULIC ADJUSTMENT

After completing the leak test and before commissioning the system, the individual heating circuits must be set (according to DIN EN 1264 / ENEV). The setting values of the individual heating circuits must be determined in the project documents and set on the flow indicators of the supply valve.

7. PRODUCTION OF DAUB AND COMMISSIONING OF UNDERFLOOR HEATING

Filling of the underfloor heating pipes must always be carried out after a successful pressure test of the pipes with water, for which a report has been drawn up. The grouting is carried out on a pipe filled with water and pressurized to operating pressure. The daub must comply with DIN 1055.

Cement screed

A FV plasticizer is added to the cement screed for better coating of the pipe, flow of concrete around the entire pipe, also better heat transmission and, last but not least, against damage that may occur due to the content of aerating additives containing calcium or plasticizers, which are added to the screed mixture. or mixing water to the screed.

Calcium sulphate screeds and cement screeds must always be heated before laying floor coverings. The first re-heating of cement screeds may be carried out after 21 days at the earliest and of calcium sulphate screeds at the earliest after 7 days. The screed heating must be gradual. The temperature can be increased daily by max. 5 °C until the maximum operating temperature is reached. A report must be drawn up on the gradual heating of the heating plate.

Dosing of plasticizer into cement screed:

$$MS = 6.0 \cdot Ap \cdot tl.\ [kg]$$

where: Ap = floor area for loor heating [m^2]

tl. = planned total screed thickness [m]

M_S = amount of FV plasticizer for concrete [kg]

Theoretical consumption of the FV plasticizer at a plate thickness of 45 mm above the pipe:

- Per 1m^2 of concrete screed = 0.39 kg of plasticizer
- Per 1m^3 of concrete screed = 6.00 kg of plasticizer

ASSEMBLY INSTRUCTIONS FOR DRY SYSTEM

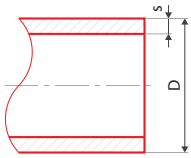
The dry underfloor heating system is preferably used in the case of renovations of houses, flats and monuments, wherever it is not possible to use floor heating with wet laying. Due to the lower heating performance compared to other laying methods, it is especially suitable for low-energy, prefabricated houses and attics. Floor made with dry system can operate at a higher heating water temperature. The water supply temperature ranges from 40 to 70 °C. The heating water supply temperature must be adapted to the resistance of all components that come into contact with the heating water temperature. For dry laying, this is limited especially by the resistance of gypsum fiber boards, which ranges up to 40 to 45 °C. The limiting property of plasterboard must be taken into account when designing and dimensioning. This method is preferably used where a lower specific heat performance of up to about 50 W/m² is sufficient, e.g. as an additional heating surface, or for tempering, or a low construction floor height is required during reconstructions.

Advantages of using a dry system:

- possibility of installation on structures with limited load-bearing capacity (attics, unbearable ceilings, vaulted ceilings)
- use in case of reconstruction
- the construction height of the dry system is 50 mm
- lower temperature inertia compared to wet laying in a concrete slab
- possibility of the first ignition immediately after laying

PIPES FOR DRY SYSTEM – FV MULTIPERT-5 diameter 16 × 2.0 mm

FV MULTIPERT-5

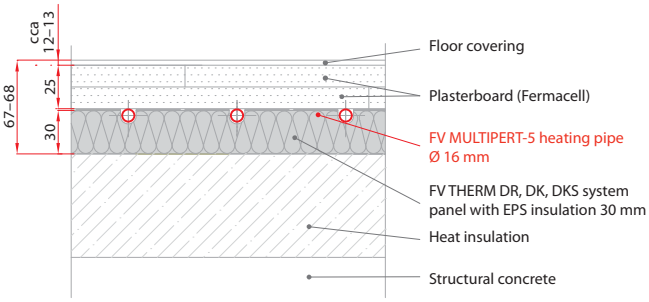


				dm³	#	D [mm]	s [mm]
16 × 2.0	m	200	0.09.	0.8	AA120016200	16	2.0
16 × 2.0	m	500	0.09.	0.8	AA120016500	16	2.0

Continuous operating temperature:	+ 70 °C
Max. short-term temperature load:	+90 °C (max. 2 years)
The operating pressure:	4 bar
Meets all the requirements of ISO 10508 for class 4 + 5	
Minimum bending radius	5 × d (d=outer pipe diameter)
Installation temperature:	from –5 °C to +30 °C
Colour	red

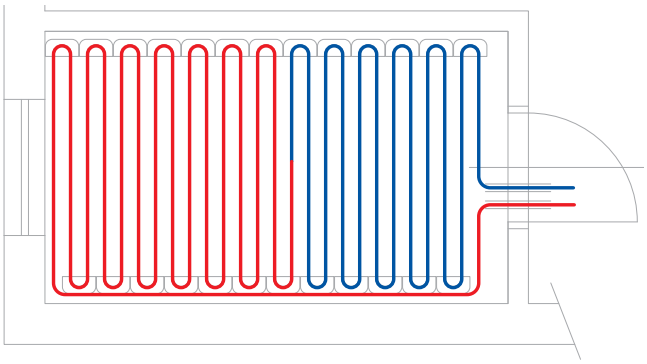
Five-layer highly flexible system with pipe made of PE-RT with increased temperature resistance according to EN ISO 22391, with oxygen barrier according to DIN 4726, with increased protection against mechanical damage during transport and manipulation on the construction site. Packed in 200 m and 500 m in a strapped coil in a cardboard package. Oxygen permeability at 40 °C is well below the limit specified in DIN 4726. Using the HP method, the EVOH barrier layer is inseparably connected to the base pipe.

FLOOR COMPOSITION WITH FV THERM DRY SYSTEM



Picture no. 1:

The total building height of the dry system is 55 mm + floor covering, see picture above. The heating pipe is laid in a meandering method see picture no. 2. The supply pipe is first led to the most cooled wall. Possibility of choosing a pipe spacing of 120 mm or 240 mm when laying a dry system. The end plates allow the use of different laying options of the pitch. The system boards for the dry system are simply shortened and modified by cutting. The required building height of the dry floor of 67 mm enables use in almost all reconstructions and new buildings.



Picture no. 2:

Thermal insulation is designed in the same way as for classic floor heating. The system board with a thickness of 30 mm has a thermal resistance under the pipe of 0.39 m² K/W, any additional insulation is carried out with polystyrene EPS 25 or, in the case of wooden ceilings, with thermal insulation inside the ceiling structure.

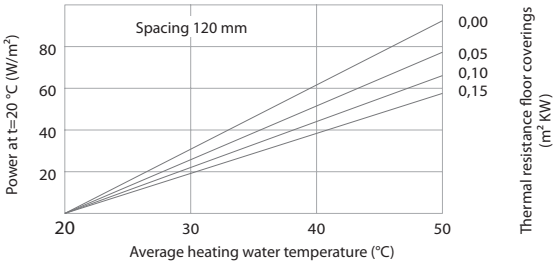
The insulation boards, both straight and end, are already covered with aluminum foil from the factory and do not need to be modified further. The FV MULTIPERT 16 × 2 heating pipe is firmly fixed in the system plates thanks to the shape of the groove.

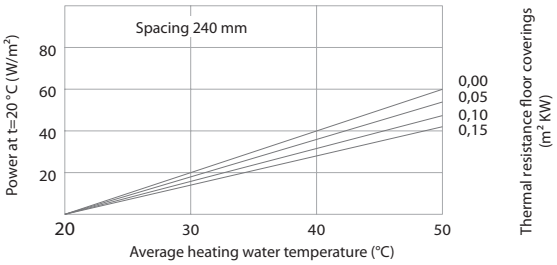
The floor heating system is covered with gypsum fiber floor boards with a total thickness of 25 mm. A floor covering (ceramic tiles, floating floor...) is laid on the floor. If the final layer of the floor is deck boards, it is possible to lay them directly on the floor heating system.

Material consumption per 1 m² of floor heating

material	pitch 120	pitch 240
heating pipe (m/m²)	8.4	4.2
flat board DR (pcs/m²)	1.9	
end plate DK (pcs/m²)	0.5	
end plate with DKS groove (pcs/m²)	0.5	

Thermal performance of floor heating





After laying the heating circuit of the dry system, the boards are covered with 2 gypsum fiber boards 2 × 12.5 mm (eg Fermacell, Cetris). The individual boards are laid with overlapping joints in both directions.

The final floor covering (tiles, vinyl, carpet, floating floor with a suitable perforated underlay…) is laid on gypsum fiber boards. The composition of the dry system allows the floor to be heated in a few minutes compared to the classic wet process.

The average power of the dry system is 50–60 W/m^2. Before laying the dry system, it is necessary to develop a detailed laying plan of boards and assembly of pipes.

REGULATIONS

Underfloor heating regulation is possible by changing the heating water temperature or by changing the flow in the individual circuits. The heating water temperature may react to the outside temperature by means of equithermal regulation at the source.

The flow regulation is possible to do manually, using flow meters on individual circuits. Another way is to install room thermostats, which provide control of thermal actuators on the underfloor heating manifold. By regulating them, it is possible to change the flow of heating medium in the underfloor heating circuits and thus reduce or increase the temperature of individual rooms.

CONSTRUCTION READINESS BEFORE LAYING A DRY SYSTEM

Proper laying of dry underfloor heating requires a project, min. laying drawings and the usual construction readiness and coordination with other professions on the construction site.

The implementation project must take into account not only the sufficient construction height for the floor heating itself, but also the height for laying thermal insulation on the floors of the house to prevent heat leakage into the surroundings. Thermal insulation height requirements vary according to the type of the house and the thermal effects in each room. There are different requirements for a room above the heated or unheated garage and other for the room where the subsoil is ground. The actual height of thermal insulation is determined by the project. Thermal insulation must meet the requirements for classification of the building into individual energy classes.

The recommended height of thermal insulation on the ground floor of the house above the unheated areas is:

- Passive house 30 cm
- Low-energy house 20–25 cm
- Standard recommended height 10–16 cm

The recommended height of thermal insulation above the heated areas is 10 to 12 cm. Impact insulation with a thickness of 2 cm is also included in this height.

The system board for the dry system is 25 mm thick. Any additional insulation according to the project requirements is carried out with stabilized polystyrene floor min. EPS 100, to prevent the floor from falling lower. It is favorable to lay in two layers of polystyrene laid transversely on top of each other, so the whole structure is more stabilized and you avoid thermal bridges from the subsoil of the house.

Before laying underfloor heating, the following must be installed:

- plumbing distribution,
- sewerage,
- wiring,
- a central vacuum cleaner (optional),
- plaster walls

The actual laying of the entire thermal insulation and underfloor heating system starts from the base board. Horizontal waterproofing must be carried out on the base board.

In case of installation of floor heating on the floor in contact with the ground, the radon load of the building must be checked or measures taken against radon in accordance with ČSN 730601 Protection of buildings against radon from subsoil and ČSN 730602 Protection of buildings against radon and gamma radiation from building materials. If pipes are laid on the supporting base, then they must be located before laying an insulation. The insulation under the pipes must not be damaged. By leveling, it is necessary to re-create a flat surface for laying the insulation layer – at least for laying impact insulation.

If the substrate contains residual moisture, the construction treatment (laying of PE-foil) must prevent moisture from rising into the dry floor structure.

Dry construction products must not be exposed to high humidity before, during and after construction.

After the installation work, the device must be professionally filled and the watertightness checked. The specifications of the VDI 2035 standard (damage prevention in hot water heating systems) must be observed.

All supply and return valves must be connected to the heating circuit switchboard. The connection pipe from and to the source is with a 1 "AG connection, optionally from the left or from the right. A hose must be connected to the filling tap from the water source. A hose ending in the drain or outside the house must be connected to the return valve. The flow direction must be observed. After opening the supply valve, it is necessary to bleed the pipe of the supply switchboard Then open the first supply valve and the first return valve.

If the heating circuit is completely filled with water so that no more air comes out at the free end, then the first heating circuit must be closed again. The same procedure must be followed for other heating circuits. At the end of the complete filling and venting process, all filling and draining valves are closed. All supply and return valves must then be opened. The water-filled system must now be subjected to a pressure test in accordance with the requirements of the ČSN EN 1264 standard. The pressure test must be carried out with water to prevent damage to the pipes. The test pressure is twice the operating pressure, but at least 6 bar (according to ČSN EN 1264-4). After two hours, the test pressure must be restored. Any pressure drop is usually due to pipe expansion. The duration of the test is 12 hours. The pressure test is successful if there is no water leaking or no pressure changes in the pipes, joints and connections by more than 0.1 bar per hour. A report must be drawn up on the performance of the pressure test. This protocol must be attached to the construction documentation.

To protect the heating system and safety devices, care must be taken to ensure that the ball valves of the connection set are closed during the pressure test.

WORKING PROCEDURE FOR LAYING A DRY SYSTEM

- Install the FV manifold cabinet on or under a plaster and install the underfloor heating manifold in it.
- Attach the FV edge strip around the perimeter of all walls where the underfloor heating will be.
- Put breathable protection on the wooden beam ceilings to prevent the formation of mold
- Check the flatness of the substrate, small irregularities up to 1 cm occurring in places should be leveled with suitable sealants. Smaller unevenness on larger areas should be compensated by self-leveling watering. Level out larger unevenness with suitable self-reinforcing dry embankments and cover with min. 10 mm thick plasterboard.
- Lay the thermal or impact insulation in the thickness according to the project.
- Lay the FV TBS system boards of the dry system over the entire surface, without gaps with the connection of the edge rails of the boards.
- add grooves in front of the manifold for connecting the circuit pipes to the manifold, separate the individual pipes with a layer of polystyrene
- Install the FV TBS L slats and the FV TBS C slat arches in the grooves in the FV TBS system boards according to the installation drawing.
- Wire the circuit pipes into the prepared grooves.
- Connect the supply pipes of the individual circuits to the manifold.
- Flush the heating circuits, fill with heat transfer medium and bleed.
- Perform a pressure test.

HYDRAULIC ADJUSTMENT

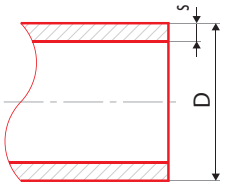
After completing the leak test and before commissioning the system, the individual heating circuits must be set (according to DIN EN 1264 / ENEV). The setting values of the individual heating circuits must be determined in the project documents and set on the flow indicators of the supply valve. Hydraulic adjustment thus contributes to energy savings. To ensure the settings made, we recommend securing and, if necessary, sealing the safety caps on the flow indicators. This allows you to quickly detect a setting change. The setting of the individual heating circuits must be carried out in accordance with DIN 1264 and EnEV after a leak test.

SYSTEM PIPES FOR CEILING COOLING

FV COOLING PE-RT 16 × 2 mm

System: **COMFORT**
Material: PE-RT/EVOH/PE-RT
Standard: EN ISO 22391, DIN 4726

Note: The flexible 5-layer pipe with a core of temperature-resistant polyethylene is protected against oxygen diffusion by special EVOH chemical treatment. Max. operating temperature 60 °C, max. operating pressure 6 bar. Connection by means of plug-in quick couplings and fittings.

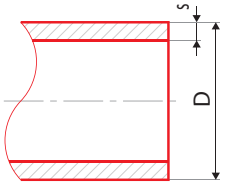


						#	D [mm]	s [mm]	l [m]
16 × 2.0	m	180	1	0.092	0.330	AA960130110	16	2.0	3

FV COOLING PE-RT 8 × 1 mm

System: **COMFORT**
Material: PE-RT/EVOH/PE-RT
Standard: ČSN EN ISO 15876, DIN 4726

Note: For registers line-up and forming of the active cooling and heating areas. Pipe core from thermally resistant polybutylene is protected from air diffusion by special chemical conditioning EVOH. Maximal operational safe temperature 60°C, macimal working pressure 6 bar. Pipe surface is covered by polybutylene protective layer. Connection due to plug-in quick couplings and fittings.



						#	D [mm]	s [mm]	l [m]
8 × 1.0	m	600	1	0.022	0.200	AA960138120	8	1.0	600

SYSTEM CEILING/WALL PANELS

FV CoolFLEX cooling mat

System: **COMFORT**
Material:
Standard: –

Note: The CoolFLEX cooling mat is made of a PE-RT tube d8 × 1 mm sealed in foil, which distributes heat equally throughout the entire active area. It is available in several variants: full mat for fitting into a metal cassette, full mat with adhesive strips for fitting.

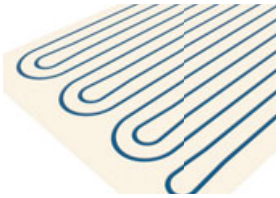
						#		width [mm]	length [cm]	thickness [mm]	weight without water [kg/m²]	weight with water [kg/m²]
500–4000 mm	m²	40	1	1.03	13.00	AA96071BCCC	perforated cassette	B*	CCC**	8.5	1.03	1.73
500–4000 mm	m²	40	1	1.03	13.00	AA96072BCCC	full cassette	CCC**	B*	8.5	1.03	1.73
500–4000 mm	m²	40	1	1.03	13.00	AA96073BCCC	full SDK	CCC**	B*	8.5	1.03	1.73
500–4000 mm	m²	40	1	1.03	13.00	AA96074BCCC	perforated SDK	CCC**	B*	8.5	1.03	1.73

Note: **B*** width (1 – 180; 2 – 260; 3 – 340; 4 – 420; 5 – 500; 6 – 580; 7 – 660; 0 – 490 for SDK), CCC – length in cm
CCC** length in cm

FV CoolPLATE cooling panel

System: **COMFORT**
Material:
Standard: –

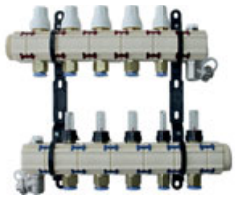
Note: PE-RT 8 × 1 cooling pipes are inserted in milled grooves in 12.5 mm thick fire-resistant plasterboard with a 40 mm pitch. The panels contain 1.2 m long inlets and are connected to the main distribution system by a system of slide-on fittings. Maximum safe temperature is 45 °C. Max. operating pressure 4 bar.



						#	width [mm]	[mm]	thickness [mm]	1 pc = area [m²]
625 × 1000 mm	pcs	1		6.80	8.75	AA960130310	625	1000	12.5	0.625
625 × 2000 mm	pcs	1		13.50	17.50	AA960130320	625	2000	12.5	1.25
1250 × 1000 mm	pcs	1		13.50	17.50	AA960130330	1250	1000	12.5	1.25
1250 × 2000 mm	pcs	1		27.00	35.00	AA960130340	1250	2000	12.5	2.50

DISTRIBUTORS

FV PLAST manifold PUSH 16, 1–4 l/min

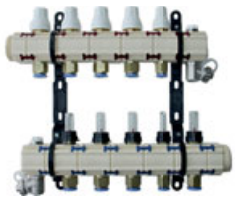


System: **COMFORT**
Material:
Standard: –

Note: Segmental manifold with thermostatic valves on the supply and adjustable flow meters 1–4 l/min on the return. Includes 1/2" vent valve, fill and drain valve, manifold brackets. Max. operating temperature 70 °C. Connection to source by 6/4" male thread. Connection of the individual circuits via PUSH quick couplers for d16 × 2 mm pipes.

								width B [mm]
	pcs	1	1	1.4	5.730	AA960116331	1	138
	pcs	1	1	1.9	5.730	AA960116332	2	192
	pcs	1	1	2.3	5.730	AA960116333	3	247
	pcs	1	1	2.8	5.730	AA960116334	4	302
	pcs	1	1	3.3	5.730	AA960116335	5	358
	pcs	1	1	3.7	8.378	AA960116336	6	414
	pcs	1	1	4.2	8.378	AA960116337	7	469
	pcs	1	1	4.7	8.378	AA960116338	8	524
	pcs	1	1	5.2	11.026	AA960116339	9	580
	pcs	1	1	5.6	11.026	AA960116340	10	635
	pcs	1	1	6.1	11.026	AA960116341	11	691
	pcs	1	1	6.6	13.675	AA960116342	12	746
	pcs	1	1	7.0	13.675	AA960116343	13	801
	pcs	1	1	7.5	13.675	AA960116344	14	856
	pcs	1	1	8.0	15.280	AA960116345	15	911
	pcs	1	1	8.5	16.243	AA960116346	16	966
	pcs	1	1	8.9	17.174	AA960116347	17	1021
	pcs	1	1	9.4	18.137	AA960116348	18	1076
	pcs	1	1	9.9	19.100	AA960116349	19	1131
	pcs	1	1	10.3	20.063	AA960116350	20	1186

FV PLAST manifold PUSH 16, 2–8 l/min



System: **COMFORT**
Material:
Standard: –

Note: Segmental manifold with thermostatic valves on the supply and adjustable flow meters 2–8 l/min on the return. Includes 1/2" vent valve, fill and drain valve, manifold brackets. Max. operating temperature 70 °C. Connection to source by 6/4" male thread. Connection of the individual circuits via PUSH quick couplers for d16 × 2 mm pipes.

								width B [mm]
	pcs	1	1	1.4	5.73	AA960116431	1	138
	pcs	1	1	1.9	5.73	AA960116432	2	192
	pcs	1	1	2.3	5.73	AA960116433	3	247
	pcs	1	1	2.8	5.73	AA960116434	4	302
	pcs	1	1	3.3	5.73	AA960116435	5	358
	pcs	1	1	3.7	8.38	AA960116436	6	414
	pcs	1	1	4.2	8.38	AA960116437	7	469
	pcs	1	1	4.7	8.38	AA960116438	8	524
	pcs	1	1	5.2	11.03	AA960116439	9	580
	pcs	1	1	5.6	11.03	AA960116440	10	635
	pcs	1	1	6.1	11.03	AA960116441	11	691
	pcs	1	1	6.6	13.67	AA960116442	12	746
	pcs	1	1	7.0	13.67	AA960116443	13	801
	pcs	1	1	7.5	13.67	AA960116444	14	856
	pcs	1	1	8.0	15.28	AA960116445	15	911
	pcs	1	1	8.5	16.24	AA960116446	16	966
	pcs	1	1	8.9	17.17	AA960116447	17	1021
	pcs	1	1	9.4	18.14	AA960116448	18	1076
	pcs	1	1	9.9	19.10	AA960116449	19	1131
	pcs	1	1	10.3	20.06	AA960116450	20	1186

FITTINGS

FV ball valve for manifolds 1"–6/4"

System: **COMFORT**
Material: Brass
Standard: –

Note: Brass ball cap for PV Push manifolds with union nut and sealing gasket.

						#	[mm]	G	
	pcs	2	1	0.3	0.59	AA960117110	46	internal 1/4"	6/4"

FV T-transitional quick coupling

System: **COMFORT**
Material: PBT
Standard: –

Note: Used for quick connection of 16 × 2 mm pipe and 8 × 1 mm cooling circuits. Reinforcement sleeves are included with the fittings.

						#	inlet diameter [mm]	circuit pipe [mm]
16 – 8 – 8 – 16	pcs	10	1	0.066	0.180	AA960134110	16	8 – 8
16 – 8 – 8	pcs	10	1	0.050	0.180	AA960134120	16	8 – 8
16 – 8 – 16	pcs	10	1	0.055	0.180	AA960134130	16	8

FV straight-way quick coupling

System: **COMFORT**
Material: PBT
Standard: –

Note: Used for quick plug-in connection of pipes 16 × 2 mm or 8 × 1 mm. Included are two reinforcing sleeves matching the respective pipe diameter.

						#	1st tube diameter [mm]	2nd tube diameter [mm]
8 – 8	pcs	10	1	0.015	0.05	AA960134210	8	8
16 – 16	pcs	10	1	0.038	0.12	AA960134220	16	16

FV quick coupling elbow

System: **COMFORT**
Material: PBT
Standard: –

Note: Used for quick connection of 16 × 2 mm or 8 × 1 mm tubes to a 90° angle. Two reinforcing sleeves are included to match the respective pipe diameter.

						#	inlet diameter [mm]
8 – 8	pcs	10	1	0.066	0.050	AA960134310	8
16 – 16	pcs	10	1	0.045	0.120	AA960134320	16

FV blinder (sealing)

System: **COMFORT**
Material: PP
Standard: –

Note: Plug used to terminate the socket fittings of the respective pipe diameter.

						#	tube diameter [mm]
8	pcs	10	1	0.001	0.01	AA960134610	8
16	pcs	10	1	0.008	0.02	AA960134620	16

FV reinforcing sleeve for 16 × 2 mm pipe

System: **COMFORT**
Material: Brass
Standard: –

Note: Used to reinforce the pipe in the fitting to achieve a secure joint. It is included in the fittings package as standard and is available as an accessory for PV PUSH manifolds.

						#	tube diameter [mm]	
16 × 2 mm	pcs	20	1	0.004	0.06	AA960134720	16	2

ACCESSORIES

FV thermal drive for manifold FV NC – 230 V

System: **COMFORT**
Material: plastic
Standard: –

Note: Ensures control of the valves of individual branches of the manifold. Connection: coupling nut M30 × 1.5. Variant: NC (no current closed); Protection: IP65. Power consumption 2.5 W / 230 V.

						#		height [mm]	diameter [mm]	cable length [mm]
	pcs	1	1	0.146	0.36	AA916000000	230 V	70	45	1000

FV dew point sensor

System: **COMFORT**
Material: plastic, metal
Standard: –

Note: Detects any risk of condensation and transmits the information to the room thermostat or dew point converter. The sensor includes a 10 m cable. Location: on the supply pipe from the manifold, in contact with the room interior.

						#
	pcs	1	1	0.165	0.68	AA960139410

FV dew point sensor for plasterboard ceiling

System: **COMFORT**
Material: plastic, metal
Standard: –

Note: Detects any risk of condensation and transmits the information to the room thermostat or dew point converter. Supplemented with a balancing tube for installation in lightweight suspended ceilings. Cable length: 10 m. Tube length: 400 mm. Location: on the supply pipe from the manifold, in contact with the room interior.

						#
	pcs	1	1	0.25	2.10	AA960139420

FV dew point converter

System: **COMFORT**
Material: plastic
Standard: –

Note: Serves as a transmitter for dew point sensors and thermal control of the building in the application of area cooling systems. Detects the status of dew point sensors and switches the output potential-free relay contact in case of condensation risk. Allows parallel connection of up to 5 dew point sensors. Operating voltage: 24 VAC, IP20, current consumption 40 mA, potential-free switching contact: 6 (2) A/230 VAC.

						#
	pcs	1	1	0.077	0.47	AA960139510

FV clamping rail Penta

System: **COMFORT**
Material: PP
Standard: –

Note: Rigid plastic clamping bar with low profile height of 17 mm. Height after pipe installation 5 mm. The bar ensures a firm clamping of the 16 × 2 mm pipe. Pipe spacing 50 mm. Length 1 m, in 20 cm increments. Connection system for extension to unlimited length.

						#	D [mm]	[mm]	[mm]
14–18 × 1.0 m	pcs	1	100	0.181	0.820	AA960112125	14–18	50	1000

FV clamping rail

System: **COMFORT**
Material: PP
Standard: –

Note: Fixed plastic clamping bar with low profile height. The rail ensures a firm clamping and ideal routing of d8 × 1 mm pipe for ceiling cooling/heating. The rail can be joined in units.

						#	D [mm]	[mm]	[mm]
8 × 1 mm	pcs	200	1	0.068	0.280	AA960112127	8	25	800

FV arc holder for clamping rail

System: **COMFORT**
Material: PP
Standard: –

Note: Plastic bend holder for d8 × 1 mm pipe for fixing cooling and heating registers.

						#	D [mm]
14–18 × 1.0 m	pcs	100	1	0.008	0.110	AA960112128	8 × 1.0 mm

FV silicone grease for O-rings

System: **COMFORT**
Material: Silicone
Standard: –

Note: Used to lubricate pipes before inserting into PUSH fittings, pipe connection fittings or wherever sealing o-rings are used.

						#
	pcs	1	1	0.075	0.20	AA960991120

ASSEMBLY INSTRUCTIONS FOR COOLING

1. SYSTEM USE

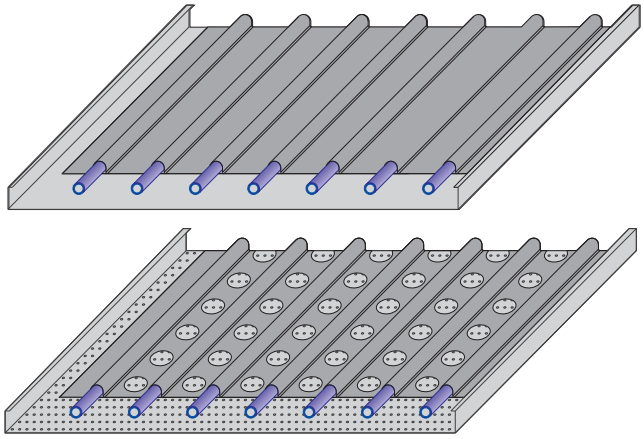
Ceiling cooling / heating FV KLIMA is a modern energy-saving surface cooling system. It is produced in several designs, adapted for different ceiling structures.

1.1. CoolFLEX SYSTEM FOR METAL CEILINGS (FULL OR ACOUSTIC)

The system consists of thin CoolFLEX cooling registers, which are housed in metal ceiling cassettes. CoolFLEX registers are tailor made according to the project specification. Cooling capacity is up to 75 W/m^2.

Installation

- The metal supporting structure is prepared according to the used coffered ceilings.
- The backbone distribution from the FV COOLING PE-RT 16 × 2 mm pipe and plug-in fittings is installed in the ceiling space.
- The CoolFLEX registers are stored in metal cassettes and connected to the backbone distribution system using quick connectors.
- Water filling, leak test and function test will be performed.

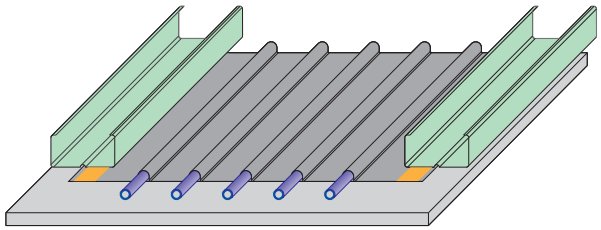


1.2. CoolFLEX SYSTEM FOR PLASTERBOARD CEILINGS (FULL OR ACOUSTIC)

The system consists of thin CoolFLEX cooling registers, which lie on plasterboard and offer easy and safe installation. To ensure maximum performance, plasterboards with an admixture of graphite with increased thermal conductivity are used. A standard metal construction designed for plasterboard ceilings is used for fastening, using CD and UD metal profiles. CoolFLEX registers are tailor made according to the project specification. Cooling capacity is up to 70 W/m^2.

Installation

- A metal supporting structure for SDK ceilings must be prepared. The spacing of the mounting CD profiles is 500 mm for solid ceilings and 333 mm for perforated acoustic ceilings.
- The backbone distribution from the FV COOLING PE-RT 16 × 2 mm pipe and plug-in fittings is installed in the ceiling space.
- The CoolFLEX registers are glued to the mounting profiles using pre-installed self-adhesive surfaces and connected to the backbone distribution using quick connectors.
- Water filling, leak test and function test will be performed.
- Subsequently, the ceiling is covered with plasterboards with thermal conductivity according to the project documentation.

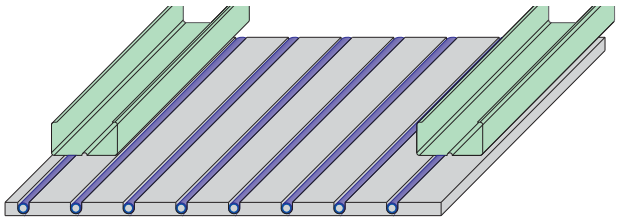


1.3. ACTIVE PLASTERBOARD CoolPLATE

The cooling pipes are placed in the plasterboard grooves. Individual CoolPLATE active cooling plates are tailor made according to the project specification. CoolPLATE active plasterboards are installed on a standard metal structure designed for lowered ceilings, using CD and UD profiles. Cooling capacity is up to 60 W/m^2.

Installation

- A metal supporting structure for SDK ceilings must be prepared. The spacing of the mounting CD profiles is 333 mm.
- The backbone distribution from the FV COOLING PE-RT 16 × 2 mm pipe and plug-in fittings is installed in the ceiling space.
- CoolPLATE active plasterboards are attached to the mounting profiles and connected to the backbone distribution using quick connectors.
- Water filling, leak test and function test will be performed.



1.4. CONCEALED SYSTEM CoolGRID

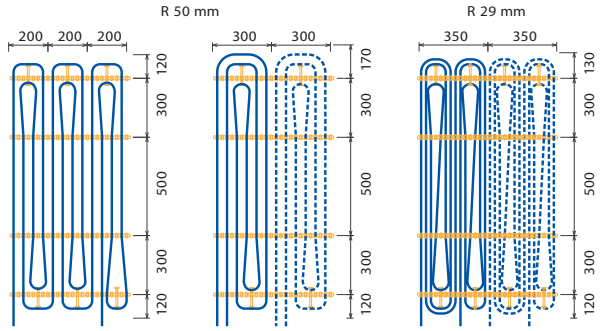
CoolGRID cooling registers are placed in the ceiling plaster. They are used in combination with core or gypsum plaster in a thickness of 10–20 mm. CoolGRID cooling registers are delivered pre-assembled from the factory or they are formed by placing the pipe in rails directly during assembly. Cooling capacity is up to 70 W/m^2 depending on the spacing and plaster mixture used.

CoolGRID system installation procedure

- The ceiling must meet the conditions of flatness of the substrate according to ČSN EN 13914-2 (5 mm/2 m). The underlying concrete of the ceiling must be cured and dry, it is necessary to remove dirt and grind the protrusions.
- In the rooms where the ceiling cooling system will be installed, the substrate will be adjusted in accordance with the technological regulations of the plaster mixture supplier.
- The backbone distribution from the FV COOLING PE-RT 16 × 2 mm pipe and plug-in fittings are installed
- Clamping rails for 8 × 1 mm pipes are attached to the ceiling surface at the defined intervals. The best way to fasten the slats with Ø 5 mm dowels or other suitable method
- The FV COOLING PB 8 × 1 mm pipe is placed in the rails and connected to the backbone distribution using quick connectors.
- Water filling, leak test and function test will be performed.

Plastering the CoolGRID system

- For plastering the ceiling, we recommend using a suitable gypsum or core plaster mixture with a thermal conductivity corresponding to the project. The application follows the regulations of the mixture supplier.
- The minimum plaster thickness is 20 mm.
- The sizes of expansion joints are governed by the regulations of the plaster mixture used.
- When plastering, the system must be pressurized and the system pressure must be checked during the process.



2. BASIC RECOMMENDATIONS FOR DESIGN AND INSTALLATION OF FV KLIMA SYSTEMS

- To prevent condensation, the ceiling must be dimensioned so that the inlet water temperature is always above the dew point temperature.
- The required height of the ceiling structure for the system of plasterboard and coffered ceilings is 6–20 cm.
- In the case of a plaster cooling ceiling system, a total plaster thickness of 2 cm is recommended.
- the optimal length of the circuit with a pipe ø 8 × 1 mm is 20–40 m
- the optimal size of the active cooling surface per branch of the distribution pipe
  ø 16 × 2 mm is 10–15 m^2
- Up to 15 cooling branches can be connected to the manifold.
- Each circuit must be equipped with a control valve with a thermal actuator.
- The dew point sensor must be located in each room on the supply pipe.
- It is recommended to provide ventilation of the cooled rooms with conditioned air.
- When using the heating system, it is recommended to use an insulating material 3–5 cm thick above the cooling registers.
- When heating with a ceiling system, the heating water temperature is limited to 45 °C.
- The system can be filled with potable water without mechanical impurities.
- Expansion of cooling / heating ceilings must be designed and implemented according to the technical documents and recommendations of the manufacturers of plaster mixtures and plasterboard.

3. COMMISSIONING

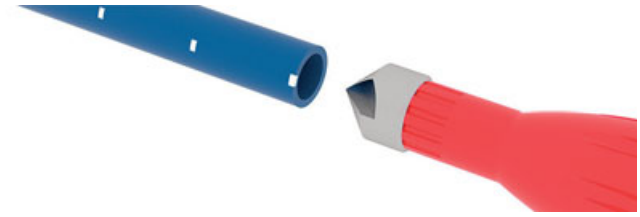
After assembling and checking the whole system, the circuits are filled with clean water according to the following procedure:

- All circuits on the manifold are closed by turning the manual control heads and flow meters.
- Pressurized water is led to the manifold filling valve and hoses are fitted to the collector drain valve and led to the sewer.
- The first circuit opens, the water is flowing and when a clean stream of water without air flows, the circuit is closed by the valve and the flow meter.
- Subsequently, another circuit is opened and so all other circuits are gradually filled.
- Then, with the valves and flow meters closed, both manifold bodies are vented.
- All circuits are opened and a leak test is performed according to the following procedure.
- The system is pressurized to 6 bar, the pressure is maintained for 10 minutes and then quickly released.
- The system is pressurized to 2 bar, the pressure is maintained for 10 minutes and then quickly released.
- The system is pressurized to 4 bar. The pressure must not fall below 3.4 bar within 30 minutes. and after the next two hours below 3.2 bar.
- There must be no leaks during the test and a record of the test must be performed.
- The circulation pump is started and the projected flow in all circuits is set by turning the flow meters.
- A functional control test is performed and the system is ready for use.

4. ASSEMBLY OF SYSTEM FITTINGS

The fittings are assembled according to the following work procedure. During the entire handling of fittings, it is necessary to pay close attention to the cleanliness of the fitting and the pipe, especially its sealing parts.

The pipe is cut with scissors perpendicular to the pipe axis. To prevent the pipe from flattening, it is recommended to turn the pipe using scissors.



The inner edge of the pipe is slightly chamfered with a manual deburrer to a depth of approx. 1 mm.

Insert the support sleeve into the pipe as far as it will go.

The end of the pipe is slightly lubricated with 15 mm FV wide silicone grease for the O-rings.

The fitting slides onto the pipe as far as it will go. Pipe 16 is inserted 27 mm, pipe 8 is inserted 20 mm. Marks printed on the pipe are used for orientation.

After assembly, it is possible to rotate the joint and after pressing the circlip, the pipe can be pulled out. When reassembling, the pipe must be relubricated and inspected for damage.

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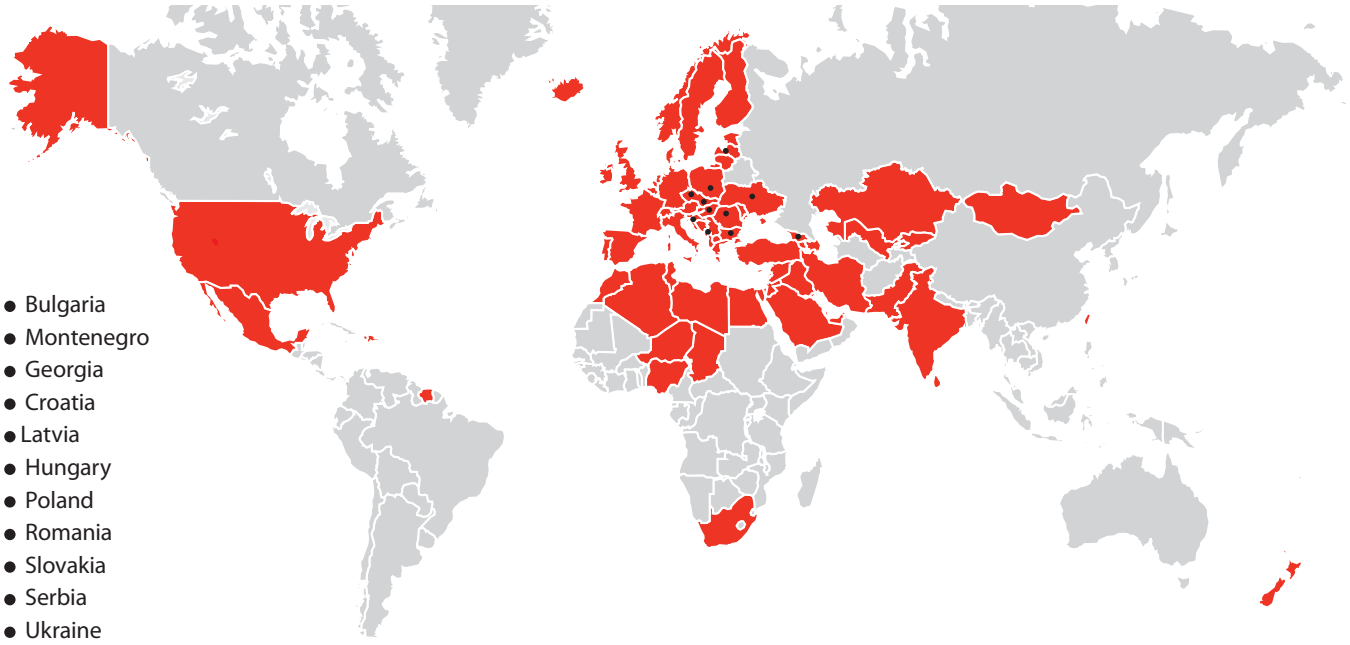

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FV – Plast was founded in 1990 and has been part of the Alca Group since 2021. Since its establishment, it has been involved in the production of a complete range of pipe systems for water distribution and heating. The product portfolio also includes floor heating and ceiling cooling systems. Currently, FV - Plast is the largest producer of PP-RCT pipes in Central Europe and the only Czech producer of PERT and AL-PERT pipes.

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