INTERNATIONAL







Specifications										
Nominal size:	DN 50 – DN 900									
Q _{max} :	7,500 m³/h									
p _{max} :	100 bar									
Filtration	25 – 3000 μm									

1. GENERAL

Product description

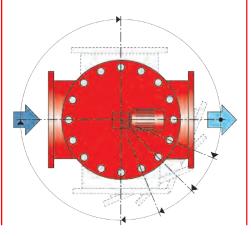
- Self-cleaning automatic filter
- Separation of solid particles from low viscosity fluids

Filter element technology

- Conical filter elements
- Wedge wire: 50 to 3000 um
- SuperMesh wire mesh: 25 to 60 µm

Product advantages

- Automatic back-flushing reduces operating costs
- Isokinetic filtration and back-flushing provides greater efficiency
- Flow-optimised housing design
- No interruption of the filtrate flow during back-flushing
- Pulse-aided back-flushing
- Various control variants with individually adjustable control parameters
- Numerous material and equipment variants available
- Ready-to-operate unit
- Variable flange positions (inlet and outlet flange with back-flush line)



	Technical data – standard models*												
Size	Pressure rating ¹⁾ (bar)	Connection Inlet/outlet	Connection back- flush line (PN 16)	Weight ²⁾ (kg)	Volume (I)	No. of filter elements	Filter area ³⁾ (cm²)	Back-flush volume ⁴⁾ (I)					
С	16	DN 50	DN 25	121	15	6 x KC	2140	25					
0	10 1)	DN 100	DN 25	145	25	6 x K0	3810	25					
1	10	DN 150	DN 40	240	60	3 x K1 3 x K2	6190	35					
2	10	DN 200	DN 50	365	105	4 x K1 4 x K2	8250	50					
2.5	10	DN 250	DN 50	450	190	6 x K3	12500	65					
3	10	DN 300	DN 65	570	280	9 x K3	18750	95					
4	6	DN 400	DN 80	750	425	18 x K3	37500	210					
5	6	DN 500	DN 80	1020	635	16 x K3 8 x K4	55760	310					
6	6	DN 600	DN 100	1610	998	32 x K3 8 x K4	89100	485					
7	6	DN 700	DN 100	1950	1355	24 x K3 20 x K4	106100	555					
8	6	DN 900	DN 150	3550	2710	54 x K5	180700	720					

Legend

- 1) Pressure rating for size 0 made of stainless steel is 16 bar (E1 = stainless steel 1.4301, 1.4541 or similar (group 304/321) / E2 = stainless steel 1.4571 or similar (group 316).
 - Housing design and housing production according to AD2000 and other design codes if necessary.
- ²⁾ Empty weight based on standard pressure rating.
- 3) Only K3 filter elements are installed when using SuperMesh filter elements (KW / SKW). The number of filter elements remains unchanged. This results in the following filter areas:

RF3-5: 50000 cm² RF3-6: 83333 cm² RF3-7: 91667 cm² RF3-8: 112500 cm²

- Per cycle, based on EPT/PTZ control mode with back-flushing valve opening time of 1.5 seconds and 1.5 bar differential pressure between outlet and backflush line – with EU control, the back-flush volume increases.
- The standard operating temperature for AutoFilt® RF3 made of stainless steel (E1 / E2) is 90°C and 60°C for housings with an interior coating (NP / NM).

FILTRATION

- The fluid to be filtered flows through the filter elements of the back-flushing filter, passing from the inside to the
- The particles collect on the smooth inner sides of the filter elements
- As the level of contamination increases, the differential pressure between the dirty and the clean side of the filter increases
- When the pressure drop reaches the pre-set trigger point, back-flushing starts automatically

INITIATION OF AUTOMATIC BACK-FLUSHING

- When the triggering differential pressure is exceeded
- By means of set timer function
- By pressing the "TEST" button

PROCEDURE FOR AUTOMATIC BACK-FLUSHING -**BACK-FLUSHING CYCLE**

Electro-pneumatic cyclic control

The electrically powered gear motor rotates the backflush arm below the filter element or elements to be cleaned and stops. The back-flushing valve is opened by a pneumatically operated rotor drive and the filter element or elements are cleaned. The pressure drop between the filtrate side and back-flush line flushes a small amount of the filtrate back through the contaminated filter elements. The contaminant particles deposited on the inside of the filter elements are detached and carried away via the back-flush arm into the back-flush line. After the "back-flush time per filter element" has elapsed, the back-flushing valve is closed. The gear motor now rotates the back-flush arm further to the next filter element(s) to be cleaned. The back-flushing valve is opened once again and the filter element or elements are back-flushed. A complete back-flushing cycle is terminated once all filter elements have been cleaned.

PTZ Pneumatic cyclic control with timer function

Like EPT, but with purely pneumatic components including the possibility of maximum filtration time, independent of differential pressure, to be set between the two back-flushing cycles. The controller of the backflushing filter automatically initiates back-flushing when the maximum filtration time without back-flushing is exceeded - timer function.

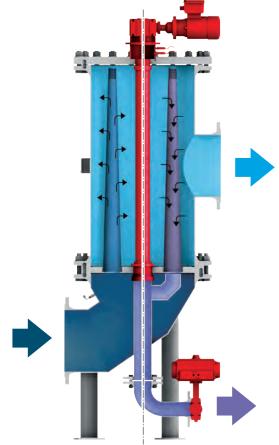
EU **Electrical circulation control**

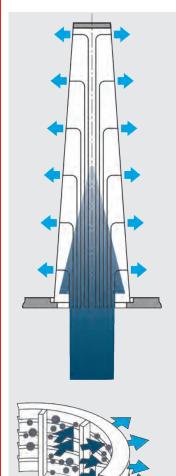
The electrically operated back-flushing valve opens. The gear motor rotates the back-flush arm continuously as it passes underneath the filter elements to be cleaned. The pressure drop between the filtrate side and back-flush line flushes a small amount of the filtrate back through the contaminated filter elements. The contaminant particles deposited on the inside of the filter elements are detached and carried away via the back-flush arm into the back-flush line. When the back-flush arm reaches its starting position, the gear motor stops and the electric back-flushing valve closes automatically.

The number of cycles can be preset via the controller.

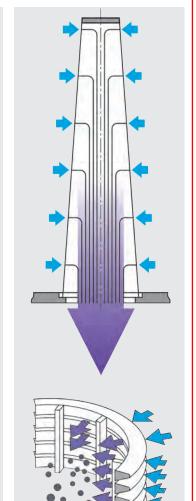
Electro-pneumatic circulation control

Like EU, but with the back-flush unit operated pneumatically.





Filtration



Back-flushing

3. SPECIAL FEATURES

FILTER ELEMENT TECHNOLOGY

Conical filter elements

Robust wedge wire or SuperMesh wire mesh filter elements made of stainless steel are used in the HYDAC AutoFilt® RF3 automatic back-flushing filter. The conical shape of the filter elements provides maximum efficiency during filtration and optimum effectiveness during back-flushing.

SuperFlush coating technology

For waste-water treatment applications, the filter elements can also be given a special non-stick coating (SuperFlush).

Advantages of a SuperFlush coating:

- Unique coating technology
- Minimises adhesive particles adhering to the filter element surface
- Reduces biofouling
- Increases the interval between two back-flushing cycles
- Increases effectiveness

FLOW-OPTIMISED DESIGN

The particularly good flow characteristics allow the filter to be compact whilst achieving high filtration performance with low pressure drop.

ISOKINETIC FILTRATION AND BACK-FLUSHING

The conical shape and configuration of the filter elements allow consistent flow, resulting in a low pressure drop and complete cleaning of the filter elements.

Advantages:

- Fewer back-flushing cycles
- Smaller back-flush volumes
- Lower pressure difference (Δp)

PULSE-AIDED BACK-FLUSHING

For the EPT and PTZ controller types, rapid opening of the pneumatic back-flushing valve generates a pressure surge (clock pulse) in the filter element openings, and supplements the cleaning effect of the back-flushing process.

SMALL BACK-FLUSH VOLUMES DUE TO CYCLIC CONTROL

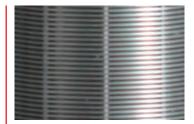
For the EPT and PTZ controller types, the back-flushing valve opens and closes for each filter element.

READY-TO-OPERATE UNIT

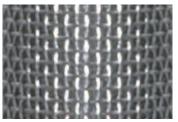
All components (controller, back-flushing valve, gear motor) are connected to the filter ready for operation. Once the pipework has been connected, all that is required is for the auxiliary power supply to be applied.

VARIABLE HOUSING CONFIGURATION

The inlet and outlet flanges and the back-flush line can be arranged in various positions in relation to one another. This makes it possible to integrate the filter easily into any system geometry (see point 1. General).



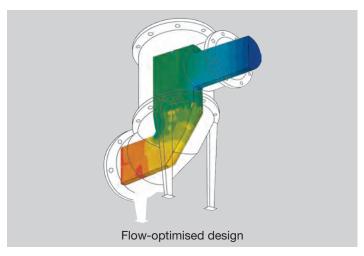
Wedge wire

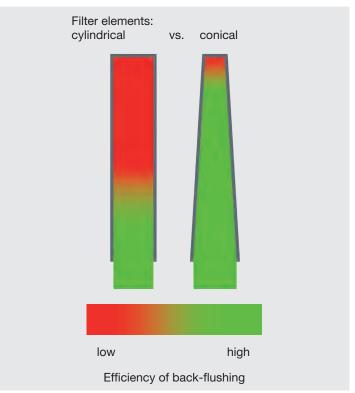


Triple-layer sintered wire mesh



With SuperFlush / without SuperFlush Coating technology for filter elements





3. SPECIAL FEATURES

FILTER CONTROL

AUTOFILT® CONTROL UNIT ACU

The clear design of the touch screen gives the user an overview of the filter's current operating status at all times. The symbols used in the display are self-explanatory, based on common international standards and colour codes. The controller is designed to ensure open connectivity (optional) to all customer interfaces.

Advantages of the AutoFilt® Control Unit:

- Intuitive menu navigation via touch screen
- Optional open connectivity to all commonly used customer interfaces (Ethernet, USB, etc.)
- Highly precise pressure measurement using HYDAC HDA pressure transmitter
- Various menu languages to choose from
- Always up-to-date with simple software updates
- Additional differential pressure gauge available as an option

Customer signals on the terminal strip:

- Input (not potential-free, 24 VDC)
 - Filter remote control
- Outputs (potential-free)
 - Back-flushing active
 - General errors (power interruption, power failure, cable breakage, etc.)
 - Differential pressure (4 20 mA signal)



4. FILTER CALCULATION*

CHECKLIST FOR FILTER CALCULATION

STEP 1: CHECKING THE PREREQUISITES

- It is crucial when operating the AutoFilt® RF3 that there is a pressure differential between the back-flush line and the filter outlet of at least 1.5 bar
 - (see circuit diagram on the following page)
- Application data is determined using filter questionnaires
- The flow velocity of 4 m/s at the flange inlet should not be exceeded
- The maximum permissible operating temperature for AutoFilt® RF3 (E1 / E2 stainless steel) made of stainless steel is 90°C
- The maximum permissible operating temperature for AutoFilt® RF3 with an inner coating (NP / NM) is 60°C
- The filter must be set up in a frost-free environment
- Our Head Office must be consulted for ambient temperatures below 0°C

STEP 2: FILTER SIZING

- Sizing based on the calculation table
- The flow rate curves apply to filtration ratings ≥ 100 µm
- The initial pressure difference (Δp) when the filter is clean should not exceed 0.2 bar
- AutoFilt® RF3 used with low particulate loading \rightarrow Sizing Δp 0.1 to 0.2 bar
- AutoFilt® RF3 used with high particulate loading \rightarrow Sizing $\Delta p < 0.1$ bar

STEP 3: DETERMINING THE FILTRATION RATING

- As a basic rule: as coarse as possible - as fine as necessary!
- For filtration ratings < 100 µm, the filter pressure drop increases by roughly 30% for all sizes
- For filtration ratings < 100 µm, the maximum flow rates reduce by 30%

STEP 4: CHECKING THE PARTICULATE LOADING

- Rule of thumb: The maximum solid particle content up to 300 mg/l depends on the particle distribution and the contamination type – for values outside the specified range, please contact the Head Office
- Note fluctuations in the dirt load (e.g. seasonal fluctuations in river water)

CALCULATION TABLES

The values given below are the minimum and maximum possible flow rates for the different sizes. For values outside these ranges, please contact our Head Office.

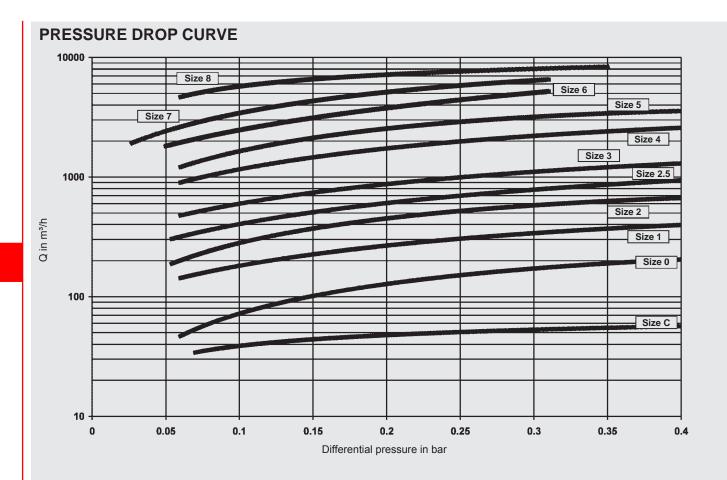
OPERATING MEDIUM – WATER

Size	Flow range [m³/h]
The flow ra	anges given apply to filtration ratings ≥ 100 µm
С	5 – 28
0	25 – 113
1	90 – 254
2	200 – 450
2.5	400 – 600
3	550 – 860
4	810 – 1700
5	1500 – 2450
6	2000 – 3600
7	3000 – 5000
8	4500 – 7500

OPERATING MEDIUM - EMULSION (CUTTING FLUIDS, **WASHING FLUIDS)**

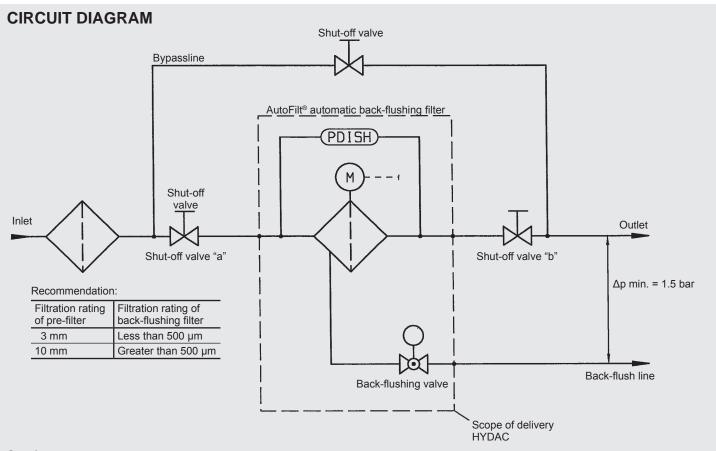
Size	Flow range [m³/h]
The flow ra	anges given apply to filtration ratings ≥ 100 µm
С	5 – 15
0	10 – 60
1	40 - 100
2	90 – 200
2.5	100 – 350
3	150 – 450
4	200 – 650
5	350 – 950
6	700 – 1500
7	1000 – 1700
8	1300 – 3000

- Valid for emulsions and oils up to a viscosity of 15 mm²/s
- Our Head Office must be consulted for applications involving grey cast iron machining, grinding, honing and fluids with a viscosity above 15 mm²/s
- For filtration ratings < 100 μm, the flow rates reduce by 30%.



Caution

The pressure drop curves apply to filtration ratings from 100 to 3000 µm. For wedge wire and SuperMesh filter elements < 100 µm, the pressure drop increases by roughly 30%.



Caution

It is crucial when operating the AutoFilt® RF3 that there is a pressure differential between the back-flush line and the filter outlet of at least 1.5 bar.

5. FILTER CONFIGURATION*

	Standard	Optional
Types of controller	• EPT	• PLC
	• EU	 Filter interlocking for parallel operation
	• EPU	 UL / CSA-approved components
	• PTZ	Safe in tropical conditions
	Manual	Open connectivity to all commonly used
	Without controller	customer interfaces
	Vitilodi controller	Customised special solutions
Connection voltages	All connection voltages and frequencies commonly (see model code)	·
Electrical protection	IP55	Other IP protection classes
classes		ATEV according to Directive 2014/00/FIL
Explosion protection		ATEX according to Directive 2014/68/EU
Housing	Housing design and housing production according	ASME Code Design with or without ASME stamp
	to AD2000 and, if required, to the Pressure Equipment Directive 97/23/EC.	
Flange connections	DIN EN flanges	• ASME
	,	• JIS
Flange positions	Variable filter inlet and filter outlet connection positions and back-flush line rotatable	
Housing materials	Carbon steel	Duplex
	• E1: stainless steel 1.4301, 1.4541 or similar	Superduplex
	(group 304/321)	 Various qualities of stainless steel
	• E2: stainless steel 1.4571 or similar (group 316)	Various qualities of carbon steel
Materials of internal parts	• E1: stainless steel 1.4301, 1.4541 or similar	Duplex
	(group 304/321)	Superduplex
	• E2: stainless steel 1.4571 or similar	Various qualities of stainless steel
	(group 316)	
Materials of filter elements	• E2: stainless steel 1.4571 or similar (group 316)	• Duplex
		Superduplex
		 Filter elements with SuperFlush coating
		Filter elements with magnet separator
		technology
External corrosion	2-coat primer	Multi-layer paintwork
protection	(not required for stainless steel housings)	Special paints for offshore applications
	Colour RAL 7040 (window grey)	Special paints for offshore applications Special paints / coatings according to customer
	(milden grey)	special paints / coatings according to customer specifications
Internal corrosion	• 2 comp onexy coating	Glass flake lining
protection	2-comp. epoxy coating 3-comp. bighly graph linked polygrathers coating.	
protection	2-comp. highly cross-linked polyurethane coating	 Special paints / coatings according to customer specifications
	Rubber lining	specifications
Measurement of pressure	Differential pressure gauge – aluminium pressure	chamber
difference	Differential pressure gauge – stainless steel pressure	
	Differential pressure gauge – with stainless steel of the stain	
	Differential pressure gauge – brass pressure char	
	HYDAC HDA 4700 stainless steel pressure transr	
	HYDAC HDA 4700 Stainless Steel pressure transmitter HYDAC HDA 4300 Duplex pressure transmitter	TIILLEI
Davit	- 111 Dito 11Dit 1000 Duplox pressure transmitter	With davit
Davit		
	'	Davit for subsequent installation
Documentation	Operating instructions	Acceptance test certificate 3.1 according to
	Declaration of incorporation according to the	DIN EN 10204 for design, pressure and
	Machinery Directive 2006/42/EC	functional testing
	Brief start-up guide	 Material inspection certificates according to
	Circuit diagram	EN 10204, 3.1 for pressure-bearing media-
		contacting housing parts
		TR CU certificates
		Approvals: third parties
		(TÜV, ABS, Lloyds, etc.)
		Welding documentation
		e.g. WPS, PQR, etc.
		Inspection plan

^{*} Other versions and customised special solutions following consultation with our Head Office.

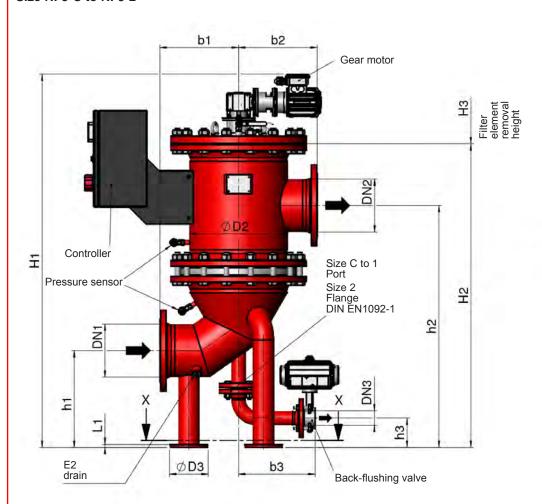
EN **7.721**.3/12.18

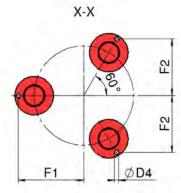
.3/12.1 EN 7.721

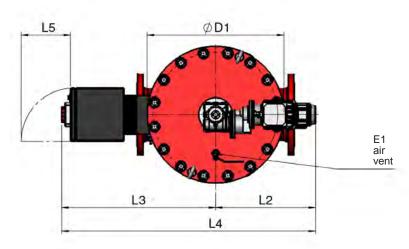
Special number
In case of special design
(Special number is assigned upon technical clarification in the Head Office)

7. DIMENSIONS

Size RF3-C to RF3-2







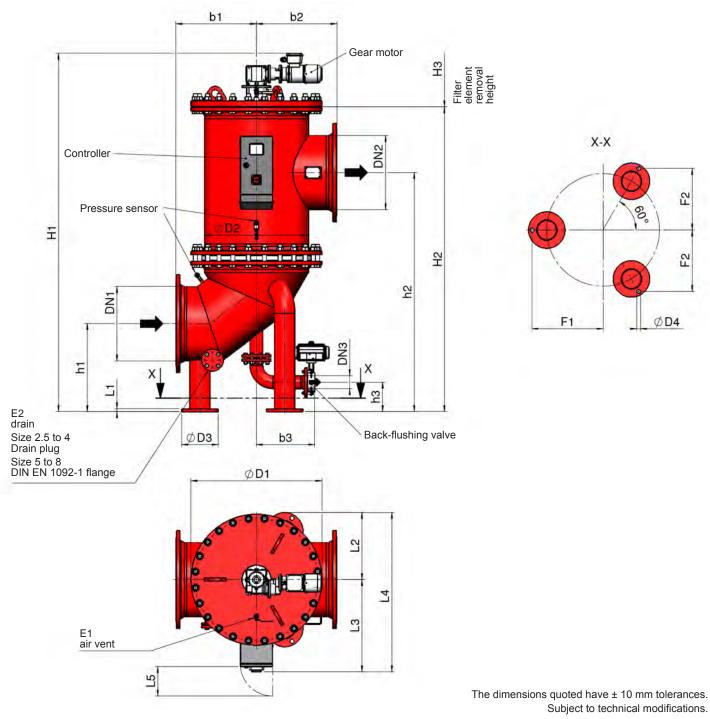
The dimensions quoted have \pm 10 mm tolerances. Subject to technical modifications.

Size	DN1	DN2	DN3	b1	b2	b3	h1	h2	h3	H1	H2	H3
RF3-C	50	50	25	200	200	255	220	579	101	967	709	550
RF3-0	100	100	25	200	200	258	250	740	100	1297	994	550
RF3-1	150	150	40	270	270	268	300	860	115	1425	1113	550
RF3-2	200	200	50	325	325	293	400	1000	122	1543	1255	550

Size	L1	L2	L3	L4	L5	D1	D2	D3	D4	E1	E2	F1	F2
RF3-C	8	342	646	988	200	340	219.1	100	12	G1/4	G1/2	155	135
RF3-0	8	342	676	1018	200	340	219.1	100	12	G1/4	G1/2	155	134
RF3-1	10	342	738	1080	200	445	323.9	120	15	G1/4	G3/4	210	186
RF3-2	12	342	783	1125	200	565	406.4	160	18	G1/4	G3/4	270	235

7. DIMENSIONS

Size RF3-2.5 to RF3-8



Size	DN1	DN2	DN3	b1	b2	b3	h1	h2	h3	H1	H2	НЗ
RF3-2.5	250	250	50	325	325	317	400	1300	120	2048	1760	700
RF3-3	300	300	65	380	380	281	500	1380	155	2198	1888	700
RF3-4	400	400	80	450	450	297	600	1526	220	2338	2033	700
RF3-5	500	500	80	550	550	300	600	1630	200	2421	2080	700
RF3-6	600	600	100	625	625	315	675	1744	200	2618	2275	700
RF3-7	700	700	100	750	750	315	700	1806	201	2654	2311	700
RF3-8	900	900	150	950	950	560	1000	2545	229	3501	3183	700

Size	L1	L2	L3	L4	L5	D1	D2	D3	D4	E1	E2	F1	F2
RF3-2.5	12	283	630	913	200	565	406.4	160	18	G1/4	G3/4	270	235
RF3-3	12	335	685	1020	200	670	508	160	18	G1/4	G3/4	322	279
RF3-4	20	389	741	1130	200	780	610	200	22	G1/4	G3/4	375	358
RF3-5	20	459	794	1253	200	895	711	250	27	G1/4	DN40	485	420
RF3-6	20	563	901	1464	200	1115	914	300	30	G1/4	DN40	565	516
RF3-7	20	611	968	1579	200	1230	1016	300	30	G1/4	DN40	652	565
RF3-8	20	712	1000	1712	200	1405	1220	300	30	G1/4	DN40	719	623









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The information in this brochure relates to the operating conditions and applications described.

For applications and/or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.



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