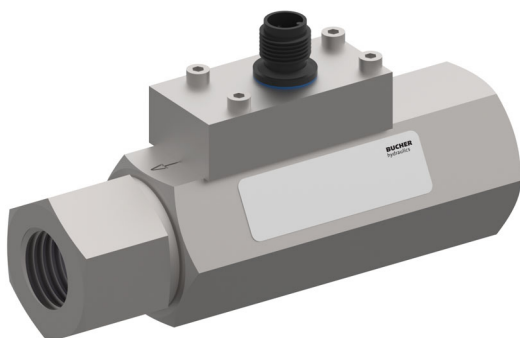


Flow Detector, Size 12

$Q_{\max} = 160 \text{ l/min (42 gpm)}$, $p_{\max} = 420 \text{ bar (6000 psi)}$

direct acting, spool type, pipe line mounting valve

Series FD 12-E-...



- Requirements according to EN ISO 13849 can be fulfilled
- High pressure rating, with safety factor of 3
- Low headloss
- Wide viscosity range
- Plug connection M12, A coding, for protection class IP 67
- Non-contact switching
- Integrated PTC thermistor module (short-circuit protected)
- Stainless steel body, other exposed parts with zinc-nickel coating
- For line-mounting installations

1 Description

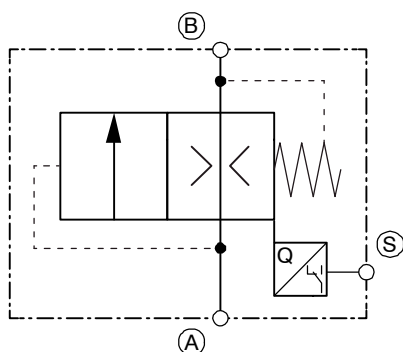
The flow detectors, series FD..., are size 12, direct-acting pipe-mounting valves with a G 1/2" threaded port. They are designed on the proven sliding-spool principle. These valves detect a preset flow rate and can be used for various monitoring functions.

Meeting the safety requirements of EN ISO 13849 often requires fitting an upstream valve as a second shut-off route. Its diagnostic information is provided by a downstream pressure transducer. In this way, a safe shut-off is always possible. The one remaining loophole is where a directional valve jams in the operated position, a situation that cannot be detected until another, parallel-connected actuator is op-

erated. This loophole can be closed with the flow detector, which is fitted downstream of the On/Off valve. When the On/Off valve is initially opened, there must be no significant flow. Next the respective directional valve should be operated.

Typically, the flow detector is used for mobile applications in which auxiliary actuators are supplied in parallel from one pressure source. This is required, for example, as a monitoring function for steering pumps in mobile machines. The body is stainless steel, all other exposed parts are zinc-nickel plated, and the flow detector is thus suitable for use in the harshest operating environments.

2 Symbol



Version FD 12-...-3PT
electrical contact "switch"

3 Technical data

General characteristics		Description, value, unit	
Designation		flow detector	
Design		pipe line mounting valve	
Controls		direct acting	
Characteristic		spool type	
Construction size		size 12	
Mounting attitude		unrestricted	
Supply port	A	G ½"	ISO 1179-1
Consumer port	B	G ½"	ISO 1179-1 (standard) or
Electrical plug connection	S	M30×2 M12-A	
Weight		0.88 kg	(1.94 lbs)
Ambient temperature range		-25° C...+100° C	(-13° F...+212° F)
Surface corrosion protection		Stainless steel body All other exposed parts with zinc-nickel coating	

Hydraulic characteristics		Description, value, unit	
Maximum operating pressure		420 bar	(6000 psi)
Maximum flow rate		160 l/min	(42 gpm)
Nominal flow / switching range		01 = 1.0 l/min 02 = 2.0 l/min 05 = 5.0 l/min 08 = 8.0 l/min 12 = 12.0 l/min 16 = 16.0 l/min (others on request)	(0.25 gpm) (0.50 gpm) (1.25 gpm) (2.00 gpm) (3.00 gpm) (4.00 gpm)
Flow direction		A → B monitoring function, see symbol	
Hydraulic fluid		HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER	
Hydraulic fluid temperature range		-25° C...+80° C	(-13° F...+176° F)
Viscosity range		3 ... 1500 mm²/s (cSt)	
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999		class 20/18/15	

Electrical characteristics		Description, value, unit	
Switching voltage range		1...36 V DC	
Max. Short-circuit voltage		36 V DC	
Switching current range		1...40 mA	
Series resistor (PTC protection resistor)		< 200 Ω	
Protection class to ISO 20 653 / EN 60 529		IP 67 with corresponding mating plug as well as proper assembly and sealing	
Electrical connection		plug connection M12, 4-pin (male), A-coding	

Electrical characteristics	Description, value, unit
Pin assignments (normal position without flow)	
Wiring diagram M12-A plug	



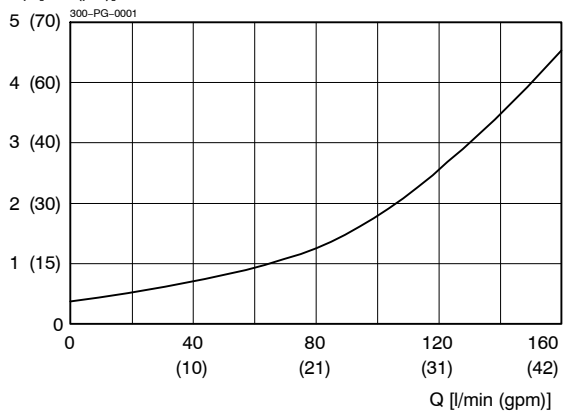
Attention:
High-current cables (> 250 A) and strong permanent magnets should be kept a minimum of 25 mm (1.00 inch) away from the flow detector.

4 Performance graphs

Measured with oil viscosity 46 mm²/s (cSt)

$\Delta p = f(Q)$ Pressure drop - Flow rate characteristic [A → B]

Δp [bar (psi)]

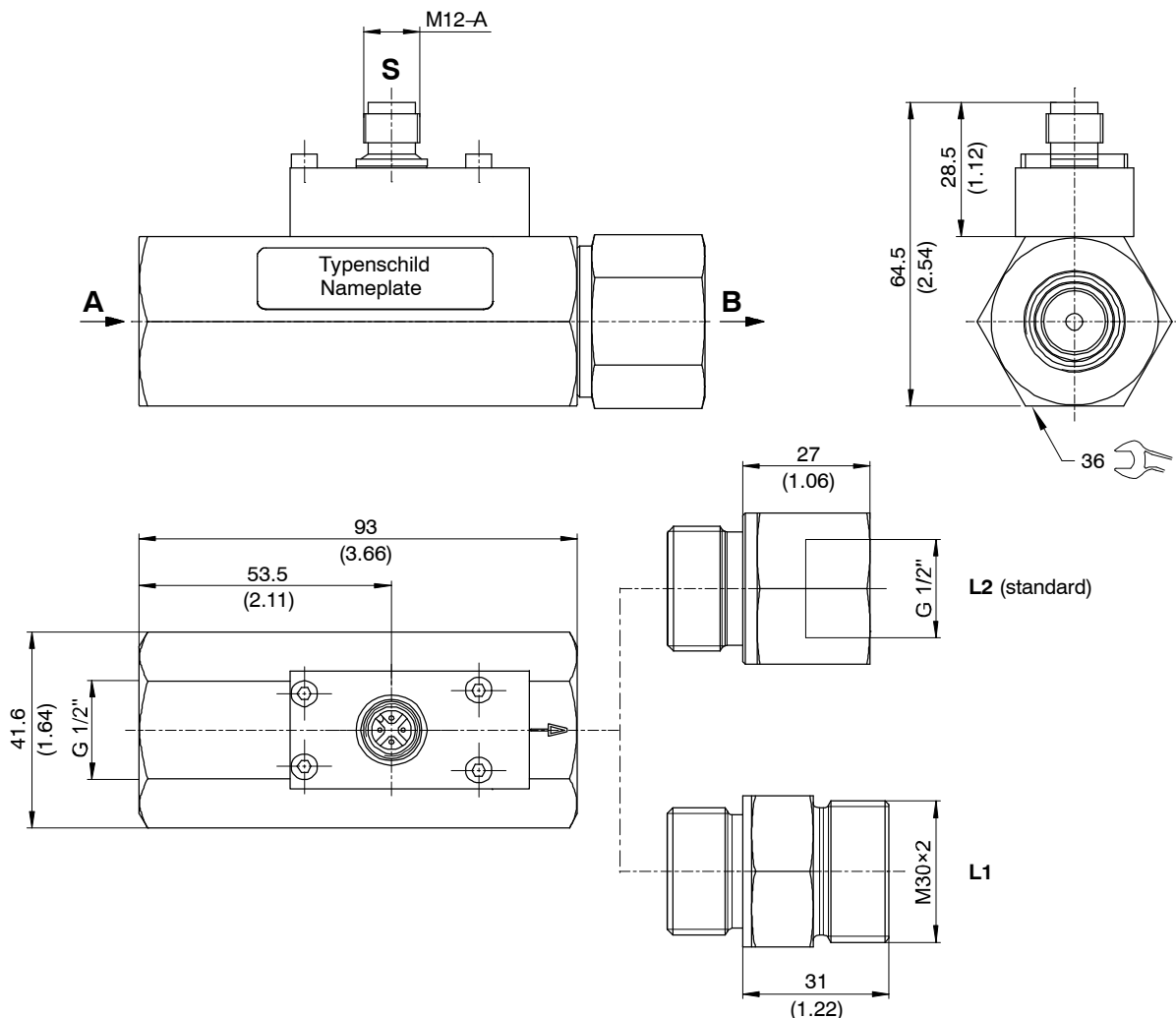


5 Dimensions & sectional view

Beispiel für die Masseinheit:
Example for the dimensional units:

0.79 = 0.79 mm millimeter

(.031) = 0.031" inch



6 Installation information



ATTENTION!

Only qualified personnel with mechanical skills may carry out any maintenance work. Generally, the only work that should ever be undertaken is to check, and possibly replace, the seals. When changing seals, oil or grease the new seals thoroughly before fitting them.



IMPORTANT!:

Protect flange surfaces from damage and observe connection designations.

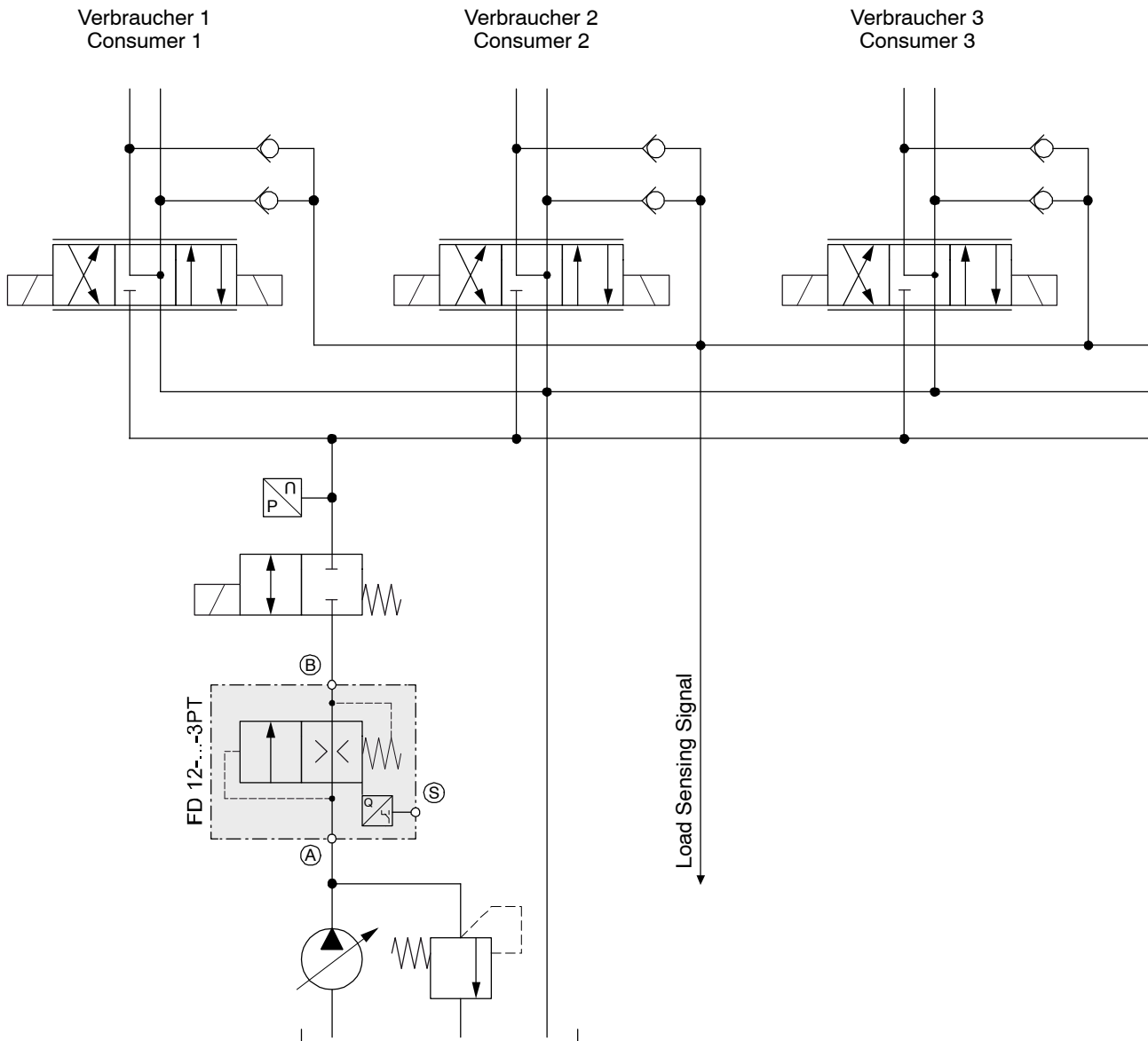


IMPORTANT!:

The valve may only be used for its intended purpose within its nominal rating. If you plan to use it outside the nominal rating, you must contact the valve manufacturer.

The ultimate responsibility for safety in the installation and use rests with the end-machine manufacturer of the mobile application.

7 Application examples



8 Ordering code

		FD	12	-	E	-	L2	-	01	-	N	-	M12A	-	3PT
FD	=	Flow detector													
12	=	Size 12													
A ... Q	=	Standard model - see relevant data sheets													
Z ... R	=	Special features - please contact BUCHER													
L2	=	Connection A = G $\frac{1}{2}$ " / B = G $\frac{1}{2}$ " (standard)													
L1	=	Connection A = G $\frac{1}{2}$ " / B = M30x2													
01	=	switching point at volume flow (Q _N) 1.0 l/min (0.25 gpm)													
02	=	switching point at volume flow (Q _N) 2.0 l/min (0.50 gpm)													
05	=	switching point at volume flow (Q _N) 5.0 l/min (1.25 gpm)													
08	=	switching point at volume flow (Q _N) 8.0 l/min (2.00 gpm)													
12	=	switching point at volume flow (Q _N) 12.0 l/min (3.00 gpm)													
16	=	switching point at volume flow (Q _N) 16.0 l/min (4.00 gpm)													
		<i>(other switching points on request)</i>													
N	=	NBR (nitril-butadien-rubber / BUNA) seals (standard)													
V	=	FKM (fluorocarbon rubber / VITON) seals													
		<i>(special seals - please consult BUCHER)</i>													
M12A	=	electrical connector plug M12x1, 4-pin (male), A coding													
3PT	=	3 pins occupied, function "switch"													

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Classification: 499.580..