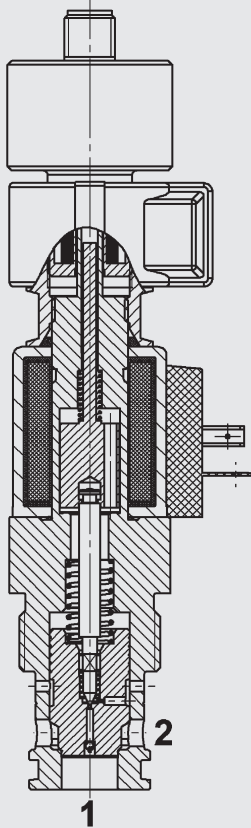


FUNCTION



The directional valve is a pilot operated poppet valve with electronic switch position monitoring. If the solenoid coil is de-energised the valve is blocked from port 2 to port 1 – this switch position is recorded inductively. In the reverse direction there is free flow through the valve. The valve piston opens at a differential pressure of approx. 1.6 bar (check function).

When energised the valve allows flow in both directions. The valve piston opens at a pressure difference of approx. 1.5 bar from 2 to 1 and at approx. 1.2 bar from 1 to 2.

Please mind: In pilot operated solenoid valves, shift performance and response times depend i.a. very much on pressure drop and volume flow during actuation. This applies particularly to valves with piston seals and/or position sensors.

2/2-Solenoid directional valve Poppet type, pilot operated Normally closed (reverse flow) With electronic switch position monitoring UNF Cartridge - 350 bar WS16ZR-01E

FEATURES

- With electronic switch position monitoring
- Excellent switching performance by high power HYDAC solenoid
- Coil seals protect the solenoid system
- Wide variety of connectors available
- Exposed surfaces zinc-nickel plated for increased corrosion protection (1000 hr salt spray test)

SPECIFICATIONS*

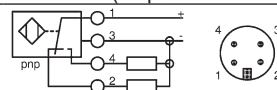
Operating pressure:	max. 350 bar
Nominal flow:	max. 140 l/min at 280 bar max. 100 l/min at 350 bar
Leakage:	max. 5 drops/min (0.25 cm ³ /min) at p ₂ = 350 bar and p ₁ = 0 bar, v = 33 mm ² /s
Media operating temperature range:	min. -20 °C to max. +100 °C
Ambient temperature range:	min. -20 °C to max. + 60 °C
Operating fluid:	Hydraulic oil to DIN 51524 Part 1, 2 and 3
Viscosity range:	min. 10 mm ² /s to max. 420 mm ² /s
Filtration of operating fluid: (acc. to ISO 4406)	p ≤ 210 bar: min. class 20/18/15 p ≥ 210 bar: min. class 18/16/13
MTTF _a :	150–1200 years, according to DIN EN ISO 13849 - 1
Installation position:	No orientation restrictions
Materials:	Valve body: steel Poppet: hardened and ground steel Seals: NBR (standard) FKM (optional, media operating temperature range -20 °C to +120 °C)
	Back-up rings: PTFE Coil: Steel / polyamide
Cavity:	FC16-2
Weight:	0.79 kg

Electrical data

Type of voltage:	DC: direct current solenoid AC: alternating current solenoid with rectifier integrated into the coil
Current draw at 20 °C:	1.5 A at 12 V DC 0.8 A at 24 V DC
Voltage tolerance:	± 15% of rated voltage
Coil duty rating:	Continuous up to max. 115% of rated voltage at max. 60° C ambient temperature
Response time: (at p _{max} , Q _{max} , v = 33 mm ² /s)	Energised: approx. 50 ms; de-energised: approx. 70 ms substantially extended response times possible at other operating conditions
Coil type:	Coil...-40-1836

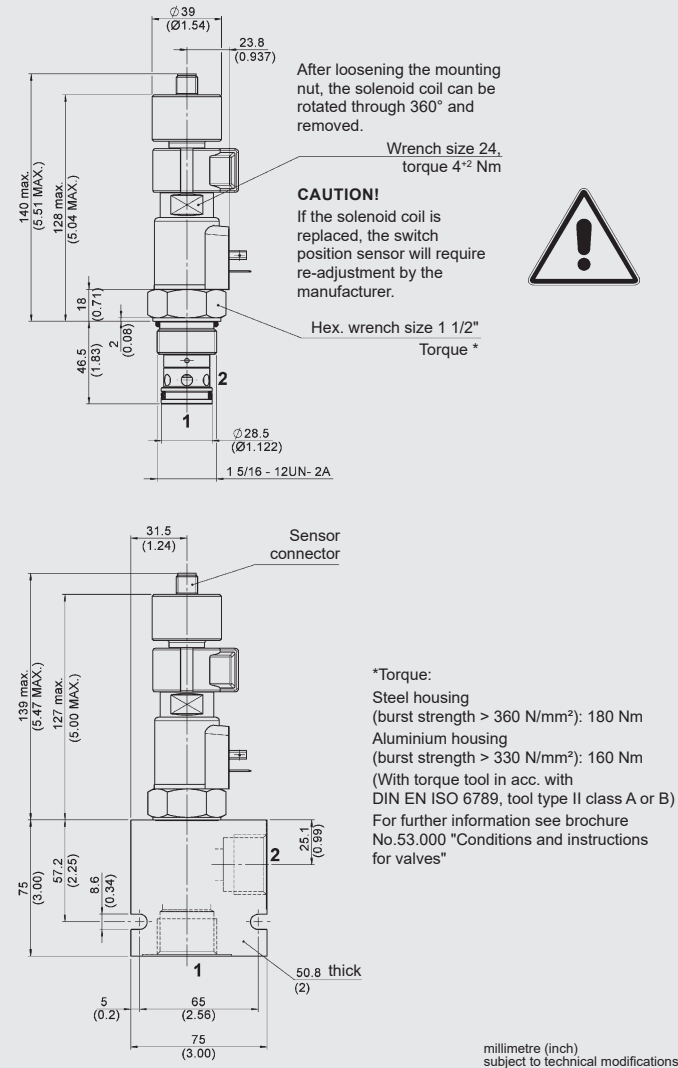
Sensor data

Supply voltage:	24 V: 20 to 32 V DC 12 V: 10.5 to 16 V DC
Reverse polarity protection of supply:	Yes
Outputs:	2 with change-over function, PNP, positive switching
Output load:	≤ 400 mA, 100% continuous
Short circuit protection:	Resistant to short circuits
Connector:	Round connector M12x1 (4-pole)
Protection class:	IP65 to DIN40050
CE conformity:	93/68/EEC 2014/30/EU
EMC:	DIN EN 61000-6-1-2-3-4
Humidity requirements:	0–95% rel. (as per DIN 40040)
Sensor connections:	



* see "Conditions and Instructions for Valves" in brochure 53.000

DIMENSIONS



MODEL CODE

WS16ZR-01E-C-N-24 DG-12

Basic model

Directional poppet valve, UNF

Type

01E = with electronic switch position monitoring

Body and ports*

C = cartridge only

Seals

N = NBR (standard)

V = FKM

Coil voltage

DC voltages

12 = 12 V DC

24 = 24 V DC

AC voltage (bridge rectifier built into the coil)

115 = 115 V AC

230 = 230 V AC

Other voltages on request

Coil connectors (type 40-1836)

DC: DG = DIN connector type A to EN 175301-803

DK = KOSTAL threaded connection M27x1

DL = 2 jacketed cables, 457 mm long, 0.75 mm²

DN = Deutsch connector DT04-2P, 2-pole, axial

DT = AMP Junior Timer, 2-pole, radial

AC: AG = DIN connector type A to EN 175301-803

Other connectors on request

Supply voltage of sensor

No details = 24 V DC

12 = 12 V DC

Standard models

Model code	Part no.
WS16ZR-01E-C-N-12DG	3980769
WS16ZR-01E-C-N-24DG	3567553

Other models on request

Inline connection housing

Code	Part no.	Material	Ports	Pressure
FH162-SB8	3032496	Steel, zinc-plated	G1"	350 bar
FH162-AB8	3037193	Aluminium, anodised	G1"	210 bar

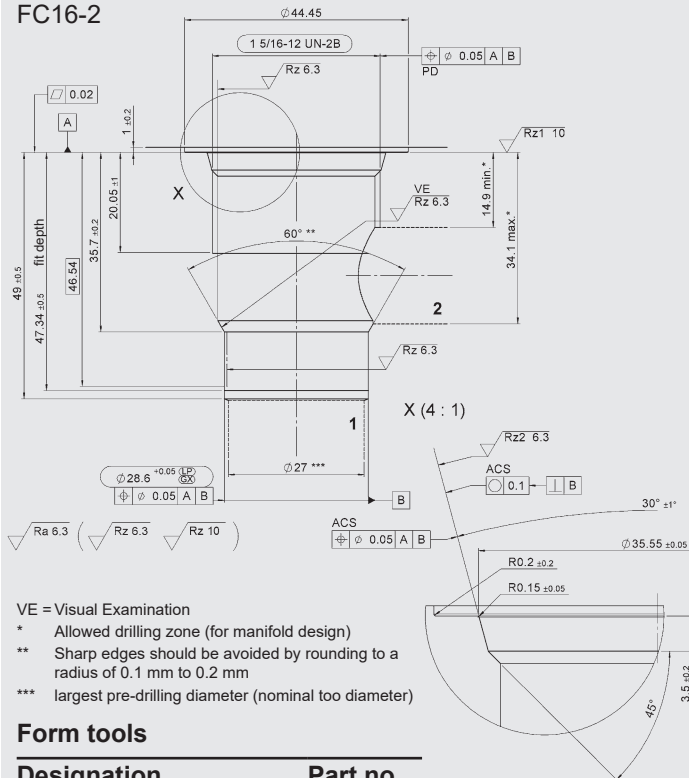
Other housings on request

Seal kits

Code	Material	Part no.
FS UNF 16/N	NBR	3651395
FS UNF 16/V	FKM	3651396

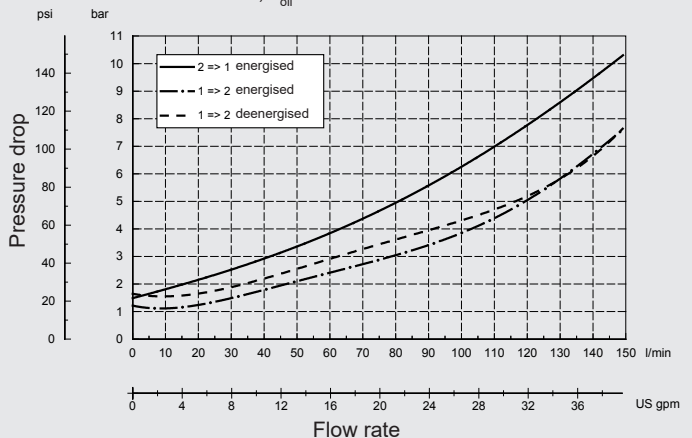
CAVITY

FC16-2



TYPICAL PERFORMANCE

Measured at $v = 33 \text{ mm}^2/\text{s}$, $T_{\text{oil}} = 46 \text{ }^\circ\text{C}$



Note

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

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