

# DSE3F

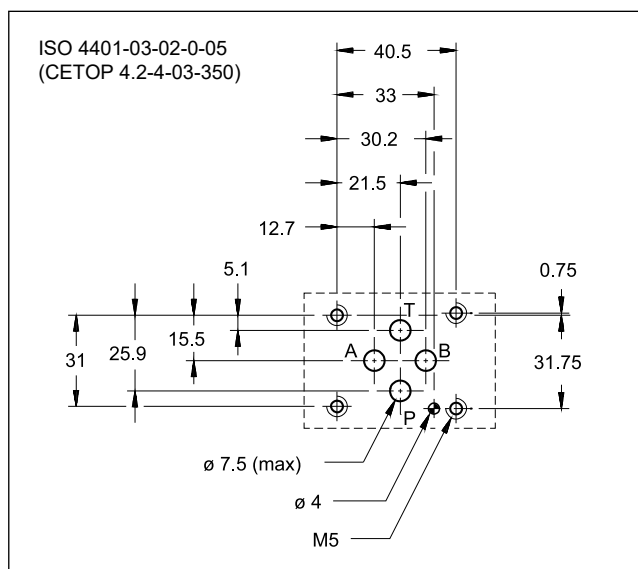
## PROPORTIONAL DIRECTIONAL CONTROL VALVE WITH FEEDBACK

### SERIES 12

#### SUBPLATE MOUNTING ISO 4401-03

**p** max **350** bar  
**Q** max **40** l/min

#### MOUNTING SURFACE



#### PERFORMANCES

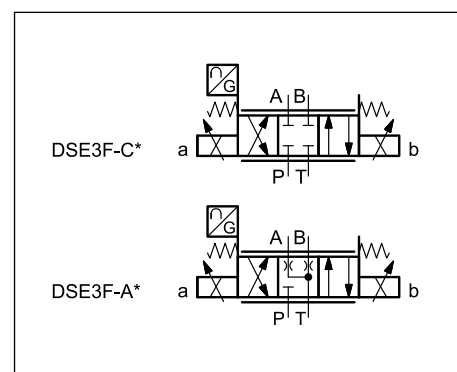
(obtained with mineral oil with viscosity of 36 cSt at 50 °C and electronic control card)

Max operating pressure: - P - A - B ports - T port	bar	350 210
Nominal flow with $\Delta p$ 10 bar P-T	l/min	8 - 16 - 26
Response times	see point 6	
Hysteresis	% of Q max	< 1,5 %
Repeatability	% of Q max	< 1 %
Electrical characteristics, IP	see point 5	
Valve reproducibility		< 5%
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	according to ISO 4406:1999 class 18/16/13	
Recommended viscosity	cSt	25
Mass: single solenoid valve double solenoid valve	kg	1,9 2,3

#### OPERATING PRINCIPLE

- The DSE3F is a proportional directional control valve, direct actuated, with electrical feedback and ports in compliance with ISO 4401-03 standards.
- It is suitable for directional and speed control of hydraulic actuators.
- The reference signal continuously adjusts the valve opening and the corresponding flow rate in a proportional manner.
- The valve must be controlled by an external electronic card to maximize the valve performances: the input signal and the signal coming from the valve are compared to obtain an accurate positioning with a reduced hysteresis.

#### HYDRAULIC SYMBOLS (typical)



## 1 - IDENTIFICATION CODE

D	S	E	3	F	-				/	12		-	D12	K1
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Direct operated \_\_\_\_\_  
directional control valve

Electric proportional control \_\_\_\_\_

Size ISO 4401-03 \_\_\_\_\_

With position feedback \_\_\_\_\_

Spool type: \_\_\_\_\_  
**C** = closed centre  
**A** = open centre

Nominal flow rate: \_\_\_\_\_  
**08** = 8 l/min  
**16** = 16 l/min  
**26** = 26 l/min

Solenoid position (omit for configuration with two solenoids): \_\_\_\_\_  
**SA** = 1 solenoid on side A

Coil electrical connection:  
plug for connector type  
EN 175301-803  
(ex DIN 43650) (**standard**)

Nominal solenoid voltage 12 V DC

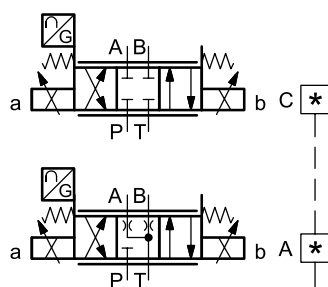
Seals:  
**N** = NBR seals for mineral oil (standard)  
**V** = FPM seals for special fluids

Series No. (the overall and mounting  
dimensions remain unchanged from 10 to 19)

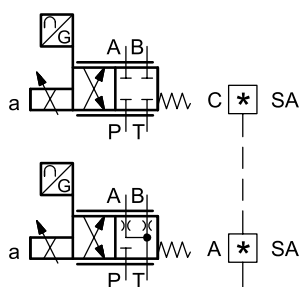
## 2 - CONFIGURATIONS

Valve configuration depends on the combination of the following elements:  
number of proportional solenoids, spool type, rated flow.

Configuration 2 solenoids  
3 positions with spring centring



Configuration 1 solenoid on side A "**SA**":  
2 positions (central + external) with spring centring

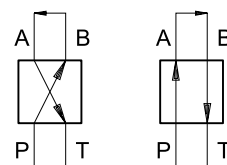


*	Controlled flow with $\Delta p$ 10 bar P-T
<b>08</b>	8 l/min
<b>16</b>	16 l/min
<b>26</b>	26 l/min

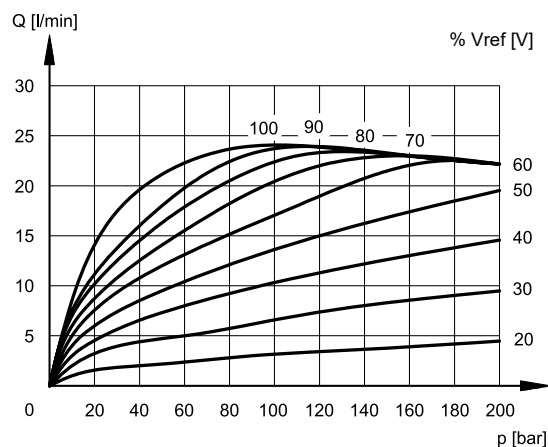
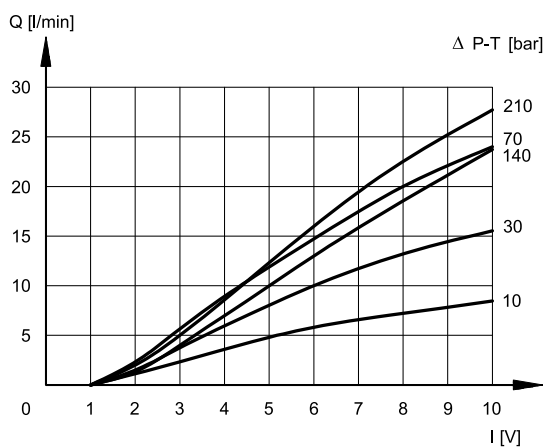
### 3 - CHARACTERISTIC CURVES

(obtained with mineral oil with viscosity of 36 cSt at 50 °C and electronics type UEIK-\*RSD)

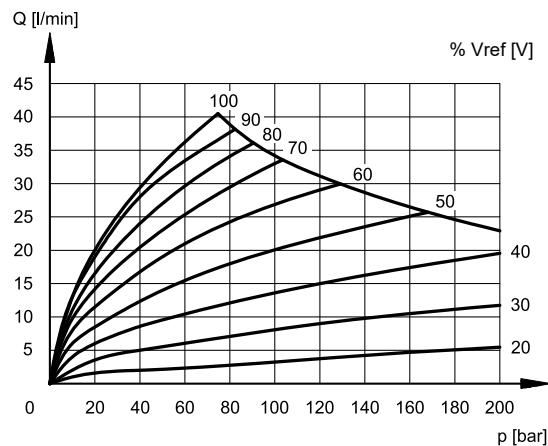
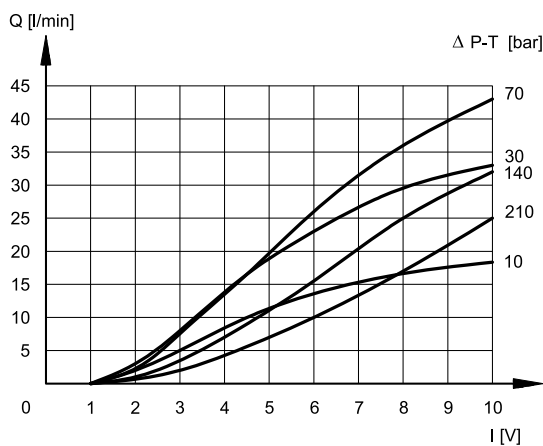
Typical flow rate curves at constant  $\Delta p$  related to the reference signal and measured for the available spools. The  $\Delta p$  values measured between P and T valve ports.



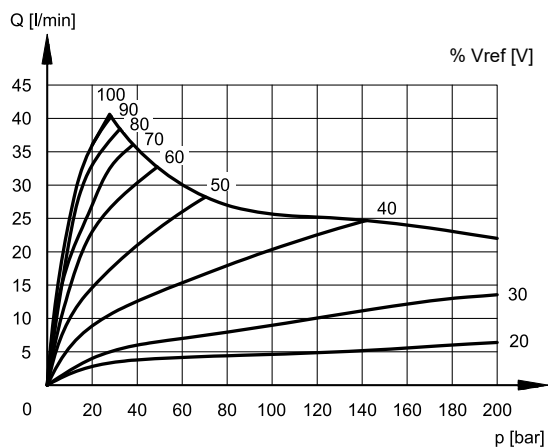
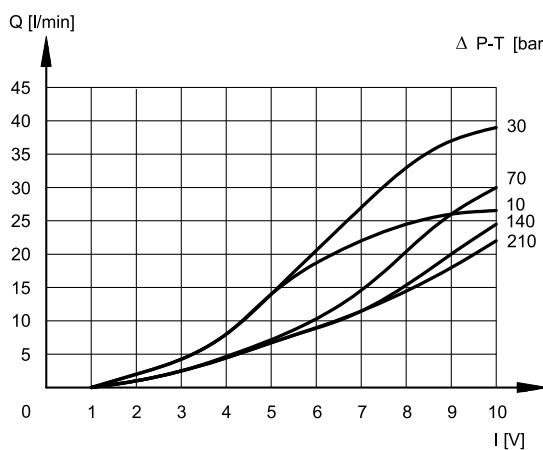
**C08 / A08**



**C16 / A16**



**C26 / A26**



### 4 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

### 5 - ELECTRICAL CHARACTERISTICS

#### 5.1 - Proportional solenoid

The proportional solenoid comprises two parts: tube and coil.

The tube, screwed to the valve body, contains the armature which is designed to reduce friction to a minimum thereby reducing hysteresis.

The coil is mounted on the tube and secured by means of a lock nut. Only the coil on side B can be rotated through 360° depending on installation clearances.

NOMINAL VOLTAGE	V DC	12
RESISTANCE (AT 20°C)	Ω	3.66
MAXIMUM CURRENT	A	1.88
DUTY CYCLE		100%
ELECTROMAGNETIC COMPATIBILITY (EMC)	According to 2014/30/EU	
CLASS OF PROTECTION Atmospheric agents (IEC EN 60529)	IP 65	

#### 5.2 - Position transducer

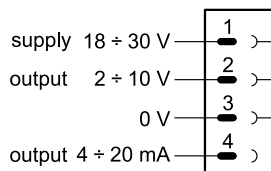
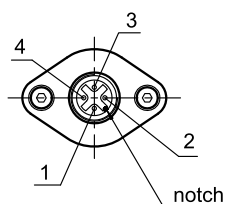
The DSE3F valve has an LVDT type position transducer with amplified signal. This type of transducer allows a precise control of the spool stroke and hence of the set flow rate, improving repeatability and hysteresis characteristics.

The transducer is fitted coaxially on the proportional solenoid and the connector features 360° positioning. The field-wireable mating connector is always included.

Use a screened cable to avoid interferences.

Technical specifications and wiring are indicated here below.

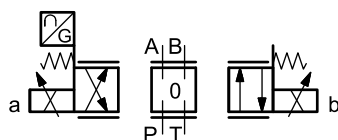
**The transducer is protected against polarity inversion on the power line.**



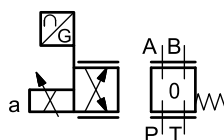
pin on control card	
UEIK-*1RSD	EDM-J*/DSE3F
8c	13
24a	10
22c	15 (NOTE)

NOTE: with jumper on pin 11

#### signal / stroke



transducer output 10V 6V 2V



10V 6V

### 6 - STEP RESPONSE

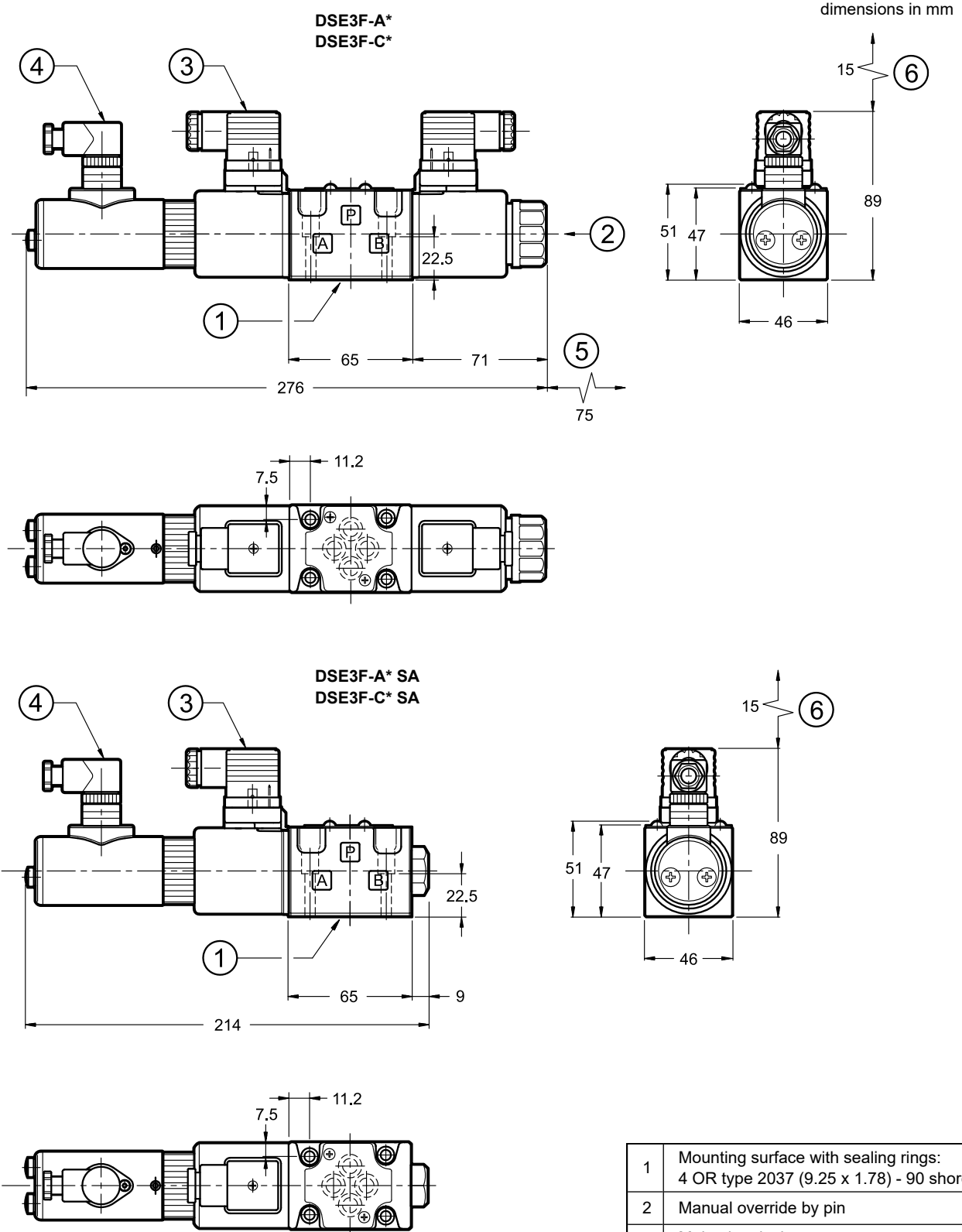
(obtained with mineral oil with viscosity of 36 cSt at 50°C and electronic control card)

Step response is the time taken for the valve to reach 90% of the set pressure value following a step change of reference signal.

The table illustrates typical response times with the C16 spool and with  $\Delta p = 30$  bar P-T.

REFERENCE SIGNAL STEP	0 → 100%	100 → 0%
Step response [ms]	30	25

## 7 - OVERALL AND MOUNTING DIMENSIONS



Fastening bolts: 4 bolts M5x30 - ISO 4762

Torque: 5 Nm (A8.8)

Threads of mounting holes: M5x10

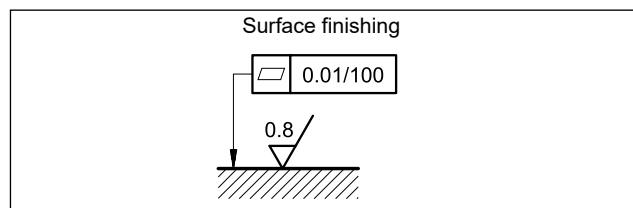


## 8 - INSTALLATION

DSE3F valves can be installed in any position without impairing correct operation.

Ensure that there is no air in the hydraulic circuit.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed fluid can easily leak between the valve and mounting surface.



## 9 - ELECTRONIC CONTROL UNITS

EDM-J2/*DSE3F	for double solenoid valve	DIN EN 50022 rail mounting	see cat. 89 255
EDM-J1/*DSE3F	for single solenoid valve		
UEIK-11RSD	for single solenoid valve	Eurocard	see cat. 89 315

The card holder for Eurocard electronics is available. See catalogue 89 900.

## 10 - SUBPLATES

(see catalogue 51 000)

PMMD-AI3G rear ports
PMMD-AL3G side ports
Ports dimensions: 3/8" BSPP