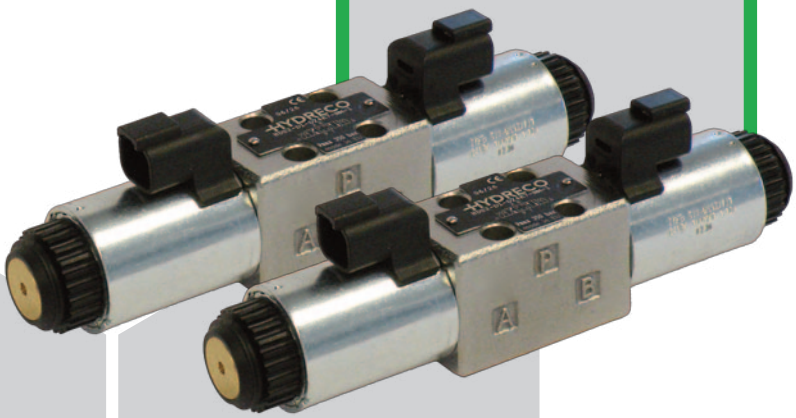
HYDRECO

HDS2

DIRECTIONAL SOLENOID VALVE

350 bar 30 l/min



TECHNICAL CATALOGUE

INTRODUCTION

The HDS2 valves are solenoid directional valves, direct operated, with porting pattern compliant to ISO 4401-02 standards.

These valves are supplied with a zinc-nickel plating on the valve body, making them the perfect choice for mobile and environmental applications that require better protection. Salt spray resistance up to 240 h (test according to UNI EN ISO 9227 and UNI EN ISO 10289 tests and standards).

The valve body is made with high strength iron castings with internal passages designed to minimize pressure drop.

FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. 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 (180 °F) causes the accelerated degradation of seals as well as the fluid physical and chemical properties.

From a safety standpoint, temperatures above 55 °C (130 °F) are not recommended.

OPERATING PARAMETERS

MAXIMUM OPERATING PRESSURE	P - A - B ports	350 bar	5000 psi
	T port	250 bar	3600 psi
FLOW RATE		30 l/min	7.9 gpm
MOUNTING SURFACE		ISO 4401-02-01-0-05 NFPA D03	

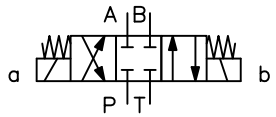
STEP RESPONSE	0 → 100%	25 ÷ 75 ms
	100 → 0%	15 ÷ 25 ms

WEIGHT	single solenoid	0.9 kg	2 lbs
	double solenoid	1.3 kg	2.9 lbs

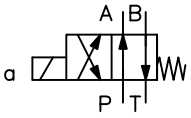
RANGE TEMPERATURES	ambient	-20 to +54 °C	-4 to +130 °F
	fluid	-20 to +82 °C	-4 to +180 °F
FLUID VISCOSITY	range	10 - 400 cSt	60 - 1900 SUS
	recommended	25 cSt	120 SUS
FLUID CONTAMINATION		ISO 4406:1999 class 20/18/15	

HYDRAULIC SYMBOLS (TYPICAL)

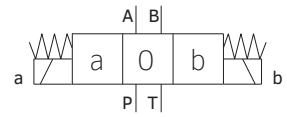
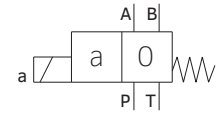
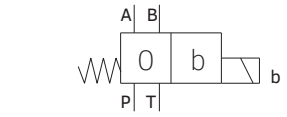
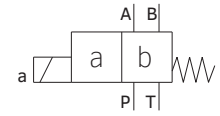
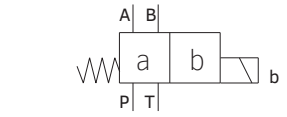
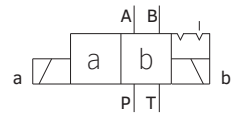
HDS2-D1



HDS2-TA1



HDS2 - ▢▢ - ▢▢ - ▢▢ - ▢

FUNCTION	
D	 double solenoid 3 positions - spring centred
A	 single solenoid at side A 2 positions - spring return
B	 single solenoid at side B 2 positions - spring return
TA	 single solenoid at side A 2 positions - spring return
TB	 single solenoid at side B 2 positions - spring return
K	 double solenoid and detent 2 positions

VOLTAGE	
D12	12 V DC solenoid
D24	24 V DC solenoid
D00	without coils

SPOOL
See next page

SEAL	
N	NBR (**standard**)
V	Viton

COIL	
K1	DIN 43650
K2	AMP Junior
K7	DT04-2P 'deutsch' zinc-nickel plated

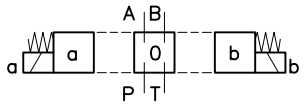
MANUAL OVERRIDE	
M	built-in with the tube, pin (**standard**)
B	built-in with the tube, boot protected
K	knob, turning

DESIGN MARK	
1	Versions with spools type 4
2	Versions with spools other than type 4

CODE EXAMPLE:

HDS2 - D1 - D12WK7 - NB - 2

FUNCTION D



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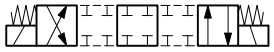

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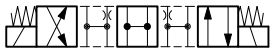

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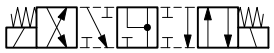

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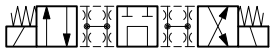
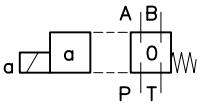


FUNCTION A



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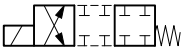

2


3


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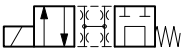
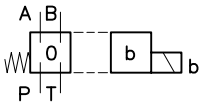


FUNCTION B



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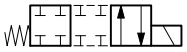

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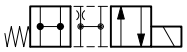

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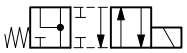

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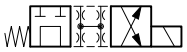
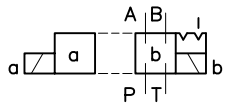
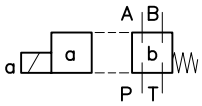


FUNCTION K



1


FUNCTION TA



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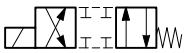

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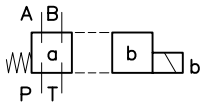
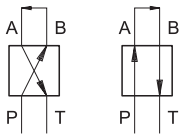


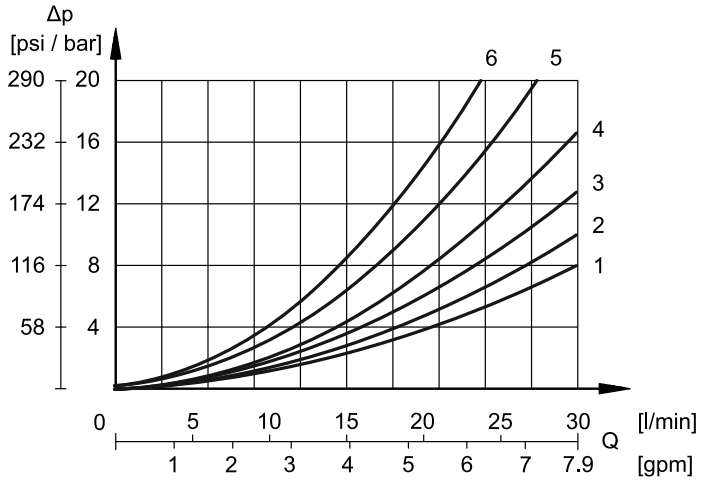
1


Flow characteristic curves obtained with mineral oil with viscosity of 36 cSt (170 sus) at 50 °C (122 °F) and 24V DC valve; the Δp values are measured between P and T (full loop) valve ports.

The operating limits can be considerably reduced if a 4-way valve is used as 3-way valve with port A or B plugged or without flow.

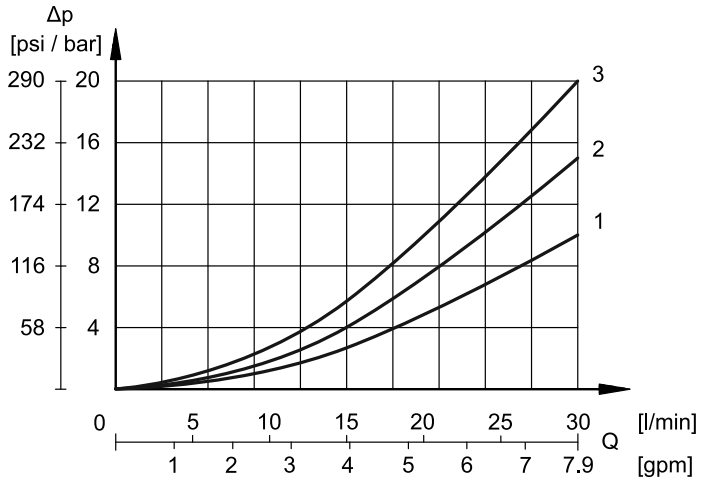


PRESSURE DROPS Δp-Q



ENERGIZED POSITION

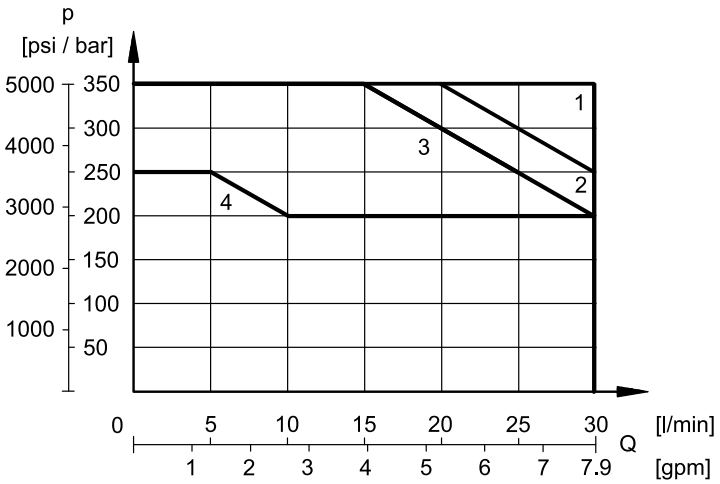
TYPE	FLOW DIRECTION			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPH			
D1, A1, B1	1	1	2	2
D2, A2, B2	2	2	3	3
D3, A3, B3	1	1	3	3
D4, A4, B4	5	5	6	6
TA	2	4	4	4
K	2	2	4	4



DE-ENERGIZED POSITION

TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
D2	-	-	1	-	-
D3	-	-	2	2	-
D4	-	-	-	-	3

PERFORMANCE CURVES - STANDARD OPERATION



TYPE	CURVE
D1, D2	1
D4	2
D3, TA	3
K	4

Solenoids are made up of two parts: tube and coil.

The tube is threaded into the valve body and includes the armature that moves immersed in oil, without wear. The inner part, in contact with the oil in the return line, ensures heat dissipation.

The coil is fastened to the tube by a retainer, and can be indexed 360°, to suit the clearance space.

Contact us to order coils as spare parts.

DUTY CYCLE		100%
MAXIMUM SWITCH ON FREQUENCY		10,000 cycles/hr
SUPPLY VOLTAGE FLUCTUATION		± 10% Vnom
ELECTROMAGNETIC COMPATIBILITY (EMC)		2014/30/EU
LOW VOLTAGE		2014/35/EU
PROTECTION CLASS FOR INSULATION	copper wire	class H (180 °C)
	coil	class F (155 °C)

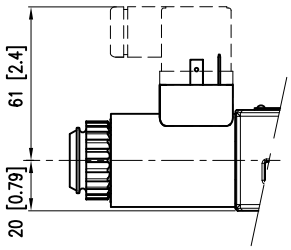
(values ± 10%)

	Nominal voltage [V]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt [W]
D12	12	4.98	2.41	28.9
D24	24	21	1.15	28

Declared IP ratings apply, in accordance with EMC 2014/30/EU, only when both the valve and connectors of an equivalent IP rating are properly installed.

Mating connectors are not included in the delivery of the solenoid valves. Connectors for K1 coils may be ordered separately.

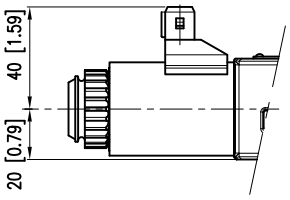
K1



DIN 43650 (EN 175301-803)
Mating connectors type ISO 4400 / DIN 43650 (EN 175301-803).

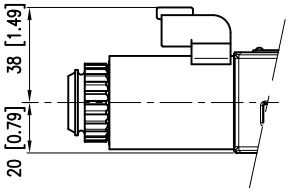
IP rating of electrical connection: IP65
IP rating of whole valve: IP65

K2



AMP Junior
IP rating of electrical connection: IP65/IP67
IP rating of whole valve: IP65

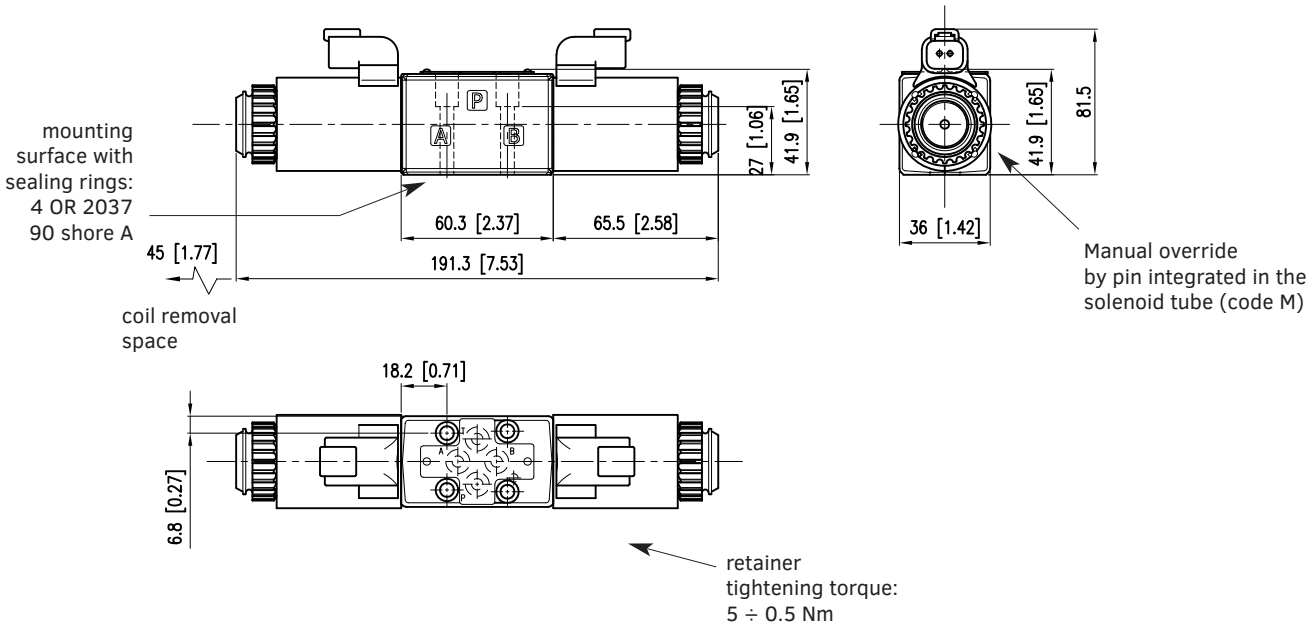
K7



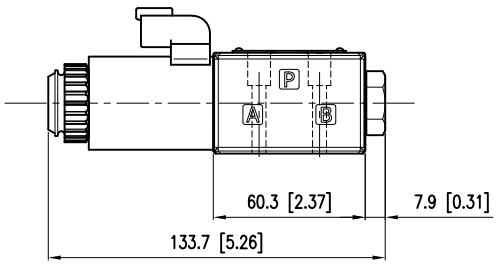
DEUTSCH DT04 MALE
IP rating of electrical connection: IP65/IP67
IP rating of whole valve: IP65

HDS2 DOUBLE SOLENOID (K7 COIL)

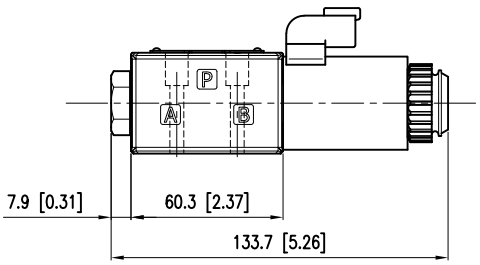
dimensions in mm [in]



HDS2 SINGLE SOLENOID SIDE A (K7 COIL)



HDS2 SINGLE SOLENOID SIDE B (K7 COIL)



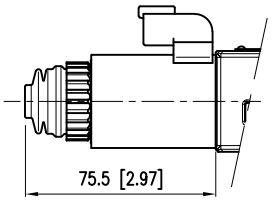
Fastening bolts:
4 SHCS M5x35 - ISO 4762 - torque 5 Nm (A8.8)
Threads of mounting holes: M5x10

The standard valve has override pins integrated in the tube. The operation of this control must be executed with a suitable tool, carefully not to damage the sliding surface.

Further manual overrides are available, entering the proper code in the model number.

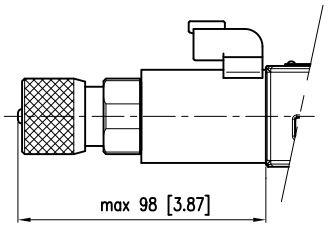
BOOT-PROTECTED

Code B



KNOB, TURNING

Code K

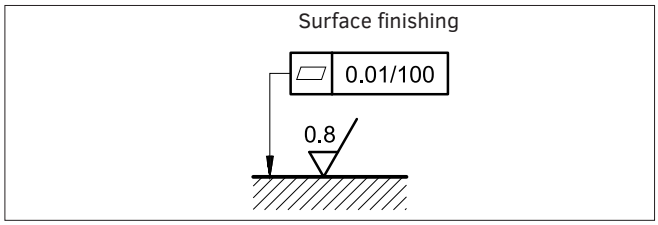


INSTALLATION

These 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 support surface.



IP RATING TIPS

The technical reference standard for IP rating is IEC 60529, which classifies and defines the degree of protection provided by equipment and electrical enclosures against intrusion.

The first digit (6) concerns the protection from solid particles (body parts to dust).

The second digit refers to protection against liquid ingress. It indicates three different types of atmospheric agents from which protection is provided:

Values from 1 to 6 → water jets.
Values 7 and 8 → immersion.
Value 9 → high pressure, high temperature water jets.

This means IP66 includes all lower levels. IP68 includes IP67 but not IP66 or lower. IP69 does not include any of the previous levels. If a device meets multiple protection levels, both must be listed, separated by a slash. (E.g. equipment rated for both temporary immersion and water jets: IP66/IP68

HYDRECO

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CONTACT INFORMATION

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AMERICAS

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QUALITY SYSTEM CERTIFICATION DNV ISO 9001

www.hydreco.com

hydreco-hydraulics

Hydreco Hydraulics - Version Control Number: HDS2_EN_2026_01