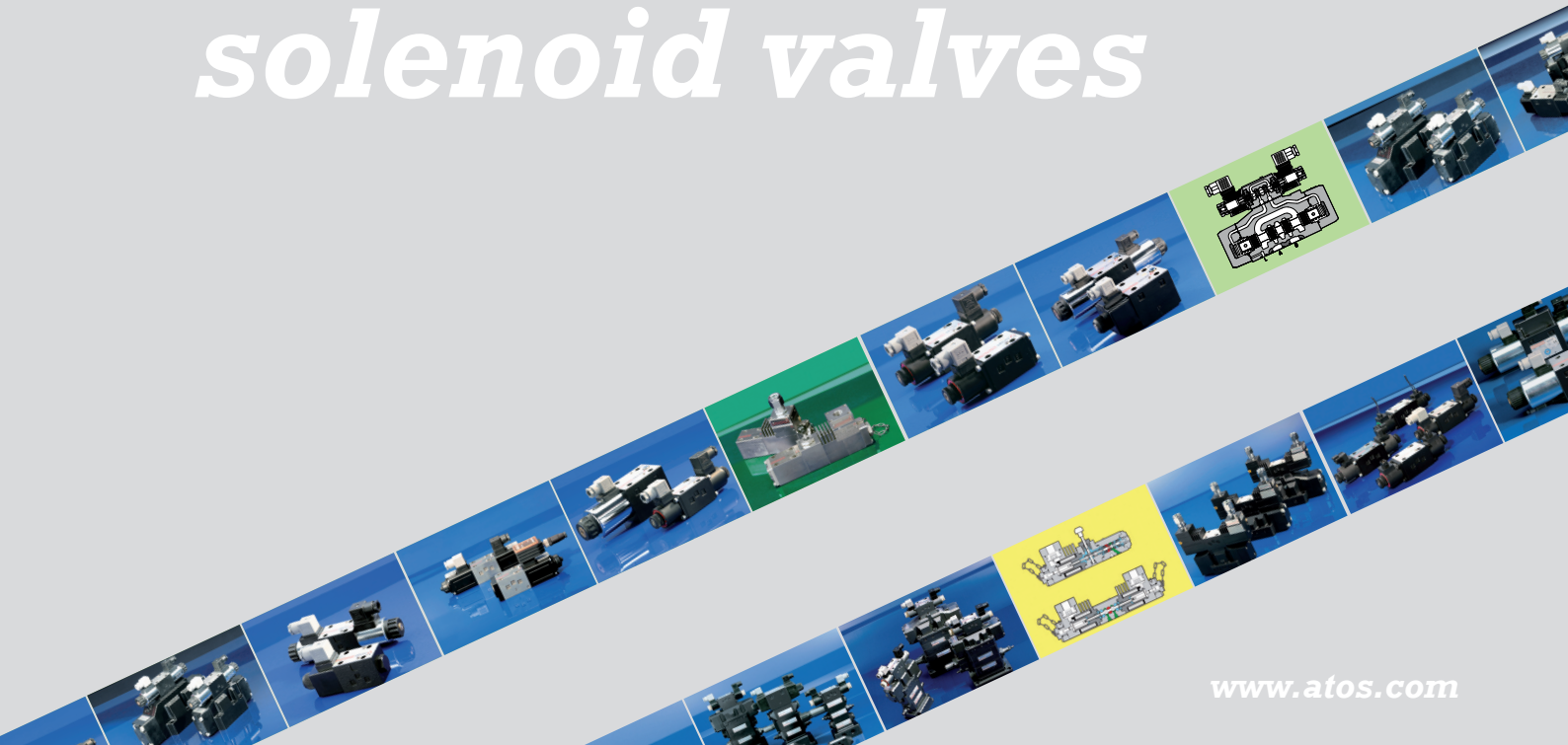
atos®

electrohydraulic

solenoid valves

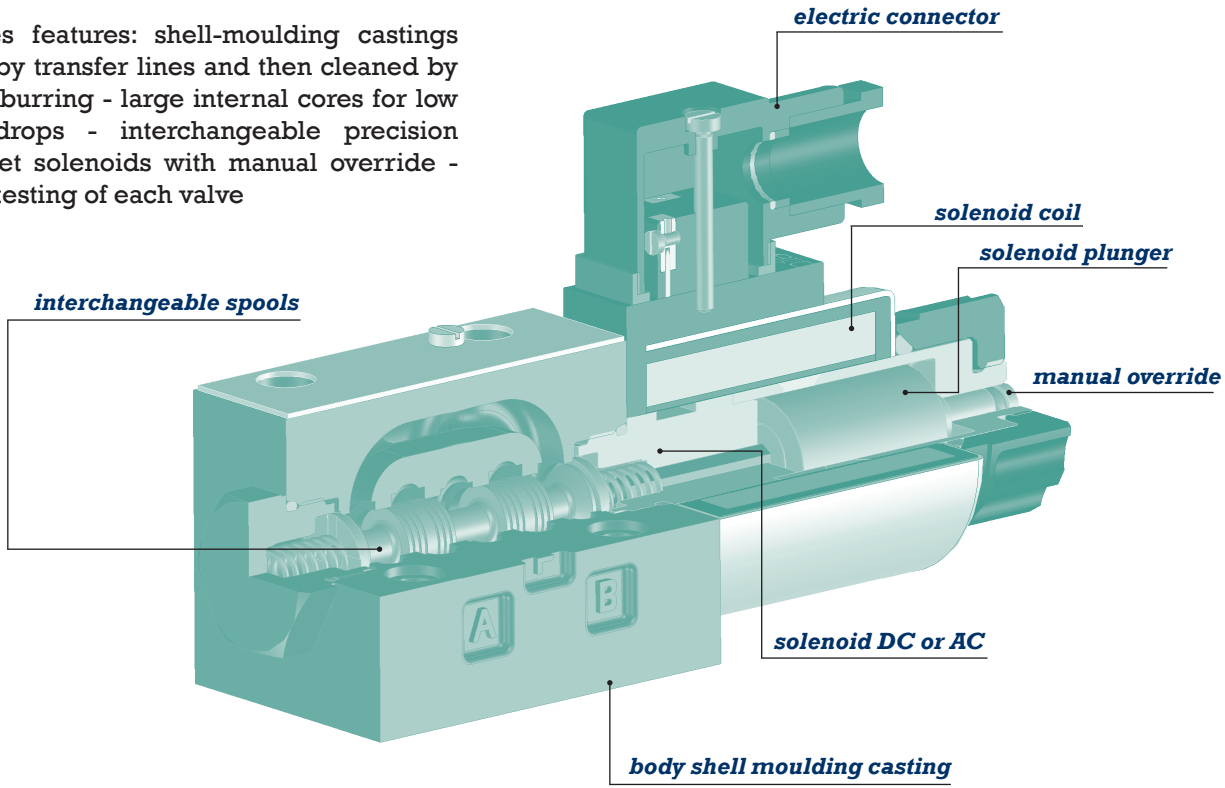


www.atos.com

Atos... a leading manufacturer of solenoid valves

many millions of valves operate today worldwide

Atos valves features: shell-moulding castings machined by transfer lines and then cleaned by thermal deburring - large internal cores for low pressure drops - interchangeable precision spools - wet solenoids with manual override - individual testing of each valve

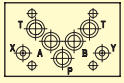


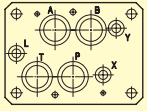
standard ISO mounting surfaces

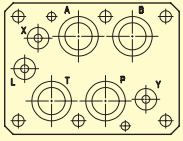
Atos solenoid valves are designed with subplate ISO mounting surface sizes 06, 10, 16, 25, 32, see below

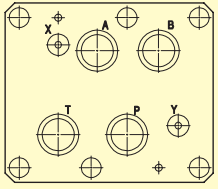
subplate mounting surfaces ISO 4401

size 06 

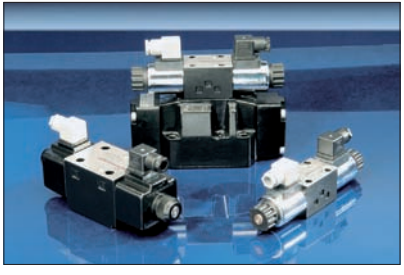
size 10 

size 16 

size 25 

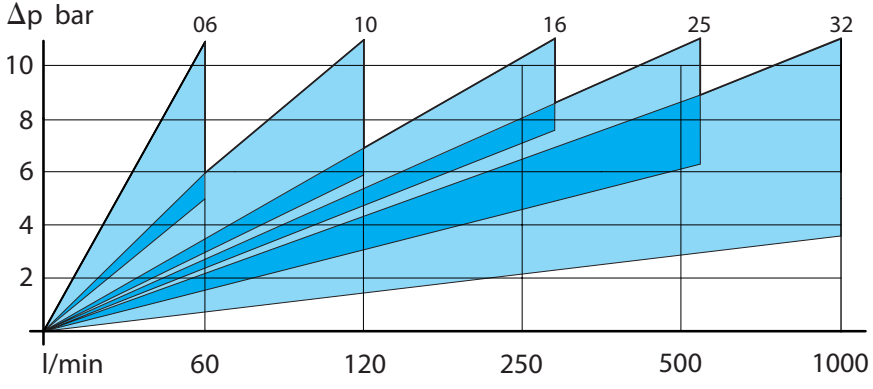
size 32 

Technical tables with valves' specific data, info & curves are available on Catalog on-line at ***www.atos.com***

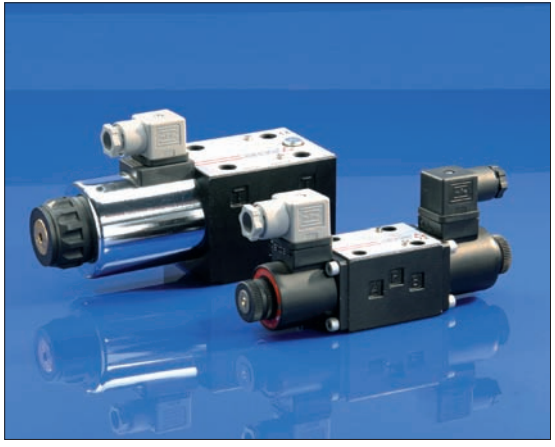


DHE, DKE, DPHE-2 valves

flow/Δp for solenoid valves



direct operated solenoid valves



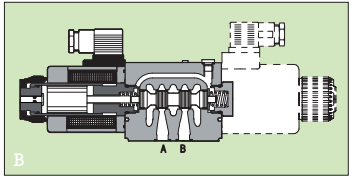
		flange solenoids		screw-in solenoids			
model		**DHI**	**DHO**	**DHE**	**DHER**	**DKE**	**DKER**
size		**06**	**06**	**06**	**06**	**10**	**10**
nominal flow - l/min		60	80	80	80	120	120
Pmax - bar	P, A, B port	350	350	350	350	315	315
	T port	120	210	210	210	120(AC), 210(DC)	160(AC), 210(DC)
electrical power DC - W		33 W	(8W) 32 W	30 W	(15W) 30 W	36 W	39 W
DC voltages	12, 14, 24, 28, 110, 220	•	•	•	•	•	•
	special 6, 9, 18, 48, 125	•					
	with electronic rectifier 110RC 230RC	•	•				
electrical power AC - VA		60 VA		65 VA	65 VA	85 VA	105 VA
AC voltages	110/50/60, 230/50/60	•		•	•	•	•
	24/50/60, 48/50/60, 120/60, 230/60	•				•	•

details on table E010, E012, E025

- **DHI** are solenoid valves for light duty, **cURus** certified. They may be used for DC or AC supply just changing coils but solenoid remains the same
- **DHE** have improved performances plus screw-in solenoids different for AC/DC supply.
- **DHER** as DHE but with **cURus** certified solenoids. Also available with low power consumption (15W) for reduced operating limits
- **DKE, DKER** are size 10 valves with screw-in solenoids different for DC/AC supply
- **DHO** are special performance size 06 valves with proportional solenoid adapted to On/Off function, also available with low power consumption (8W) for reduced operating limits
- interchangeable spools available in a wide variety of configurations, also for damped switching and low leakage
- **L** devices for controlling switching times
- **/WP** devices for manual operation by prolonged push-pin
- **/MV** or **/MO** hand lever execution
- **operating limits** of solenoid valves see tech. tables

basic spools

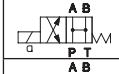
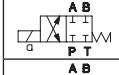
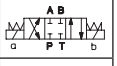
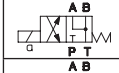
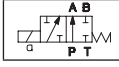
reference to operating limits at side

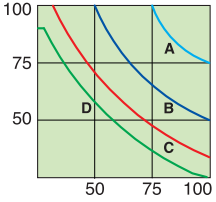


A DHE valves, single solenoid AC, double solenoid DC

B Section of DKER valve with cURus certified solenoid

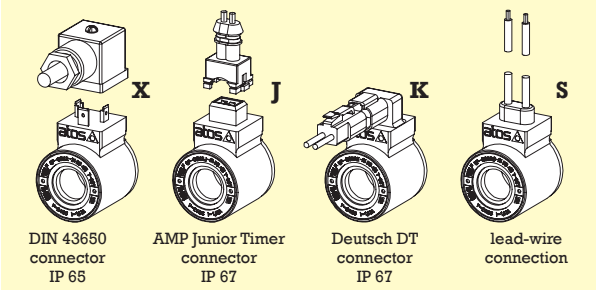
C Range of connectors of DHI valve: standard, AMP JT, Deutsch, lead-wire

Symbol	Code	DHI	DHE DHER	DKE DKER	Code	Symbol
	-631/2	B	A	A	-751/2	
	-610	B	A	A	-710	
	-611	B	A	A	-711	
	-613	C	B	B	-713	
	-632/2	D	D	C	-714	



operating limits
according to spools

coil options



DIN 43650 connector IP 65

AMP Junior Timer connector IP 67

Deutsch DT connector IP 67

lead-wire connection

X SP-666 = standard
SP-669 = built-in rectifier for AC supply on RC coils

J SP-J = AMP JT connector
K SP-K = Deutsch DT connector
S SP-S = lead-wire connection

for other electric or electronic connectors: details on table K500

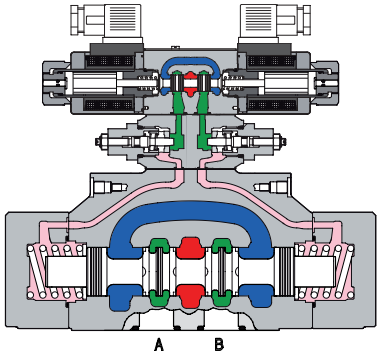
pilot operated solenoid valves

DPHI, DPHE and **DPHER** are spool type, two or three position directional two stage solenoid valves designed to operate in oil hydraulic systems.

details on table E080

model		DPH*-1	DPH*-2	DPH*-3	DPH*-6
size		10	16	25	32
nominal flow - l/min		160	300	650	1000
Pmax - bar	P, A, B, X port	350			
	T port	250			
electrical power DC or AC		see pilot valve DHI/DHE/DHER			

options: **/H** adjustable switching times **/S** spool stroke limiter **/R** check valve in P port for low pressure systems



They are operated by a direct solenoid valve available in three different executions: DHI, DHE, DHER, see page 4.

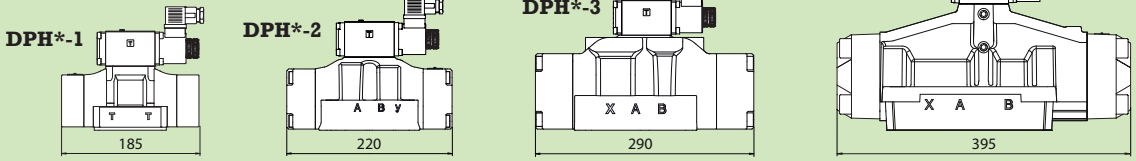
Shell-moulding castings machined by transfer lines and then cleaned by thermal deburring. Optimized flow paths largely cored with extrawide channels for low pressure drops.

Valves can be supplied with optional devices for control of switching times. Coils are easily re-placeable without aid of tools.

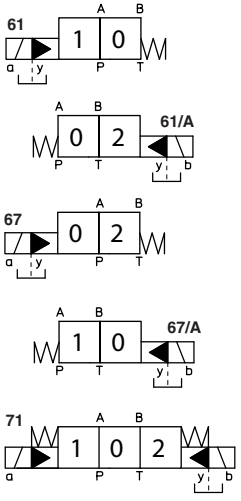
Rugged execution suitable for outdoor use.

DPHE-2, DPHE-3 pilot operated valves

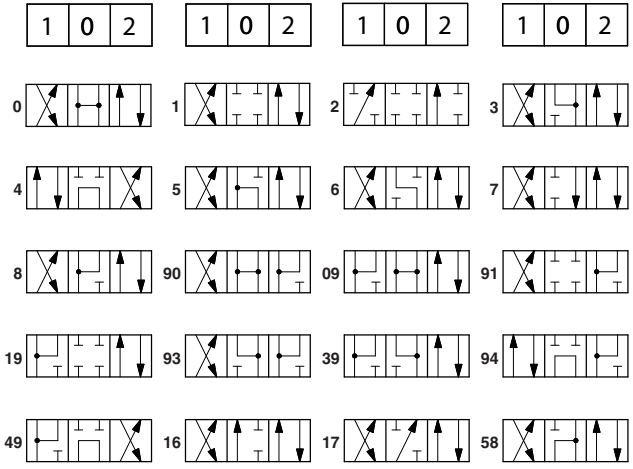
dimensions of DPH



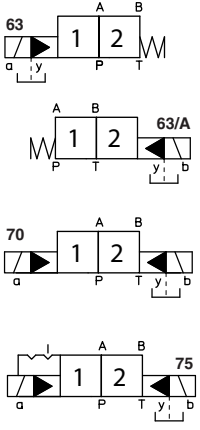
configurations



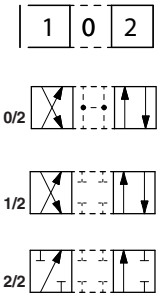
spools



configurations

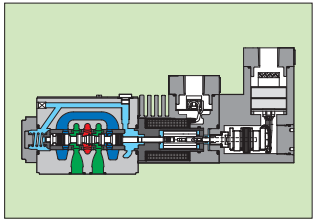


spools



explosion proof valves

A full range of ISO electrohydraulics for potential explosive environments with presence of flammable gas or dust. Atos ex-proof valves conform to international safety directives and are largely applied in thousands of systems worldwide, offering high reliability and withstanding extreme temperatures, corrosive fluids and aggressive conditions.



ex-proof solenoids valves have original ex-proof solenoids, integral and consistent to valves, designed to contain the explosion inside the enclosure, and to limit their external temperature, according to the certified class, in order to avoid self ignition of the explosive mixture in the environment.

ex-proof on-off valves

details on table E120, E125, F600

control function	ISO sizes	(1)	type code	P max bar	Q max l/min
directional, 4 way spool type	6	D	DH**A**	350	70
	10, 16, 25, 32	P	DPH**A**-1, 2, 3, 6		160 ÷ 1000
directional, 2- & 3-way poppet type, leak free	6	D	DLOH-**AO**		12
	6	D	DLOK-**AO**	250	30
2-way cartridges with ex-proof, pilot valve	16÷63	P	LIDEW-**AO**	350	160 ÷ 3600
pressure valves with ex-proof venting valve	10÷32	P	AGAM-**AO**		200 ÷ 600
	20, 32	P	ARAM-**AO**		350, 500

(1) D = direct operated; P = pilot operated

ex-proof certifications

- **ATEX 94/9/EC** standard protection mode:
  - for Gas & Dust environments - Atos code **A** or **AO**
  - for Mining plants - Atos code **A/M**
- **IECEx** international certification system - Atos code **A/IE**
- **UL 1002** american standards - Atos code **A/UL**
- **ROST** Russian Rostechnadzor - Atos code **A/RU**

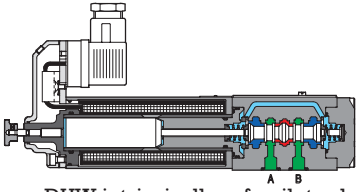
ATEX 94/9/EC ex-proof certifications are currently available for other several components, like:

- hydraulic pumps
- hydraulic cylinders
- hydraulic units
- auxiliary components

proportional valves the whole range of Atos proportional valves is available in explosion proof execution

intrinsically safe valves

"Intrinsically safe" specification is based on the principle of limiting the energy of electric circuits in environments with hazardous atmospheres.
To limit the max input current, the solenoid must be powered through specific safety barriers Y-BX-NE. In fact the intrinsically safe circuit must be unable to produce electrical surges or thermic effects which could cause explosion also in a break-down situation.



DHW intrinsically safe pilot valve

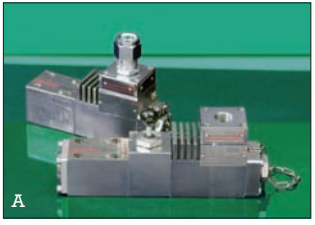
details on table E130

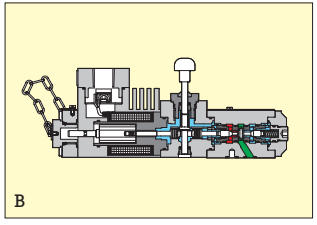
model	DHW	DLOH-OW
size	06	06
nominal flow - l/min	25	12
Pmax - bar	210	210

Intrinsically safe valves and barriers are certified according to ATEX 94/9/CE, Group I mining plants or Group II surface plants with gas or vapours environment, category 1, zone 0, 1 and 2.

stainless steel valves

Full line of electrohydraulic controls in stainless steel for corrosive environments: rugged inoxizable design, suitable for use with mineral oils, water glycol and special hydraulic fluids. Also available in special execution for water hydraulics applications.
Original stainless steel solenoids are explosion-proof type, with possible ATEX or UL ex-proof certification.


A


B


C

A-B DLOHX leak free valve with & without manual reset option
C Full range of stainless steel electrohydraulics in standard (25w), ex proof (8w) or low power (3,5w) execution

Stainless steel on-off valves

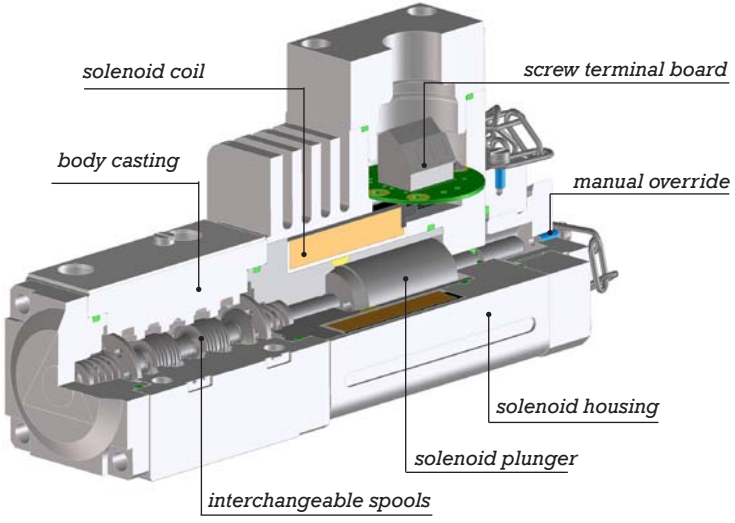
details on table E135, E137

control function	ISO sizes	(1)	type code	P max bar	Q max l/min
4 way, spool type solenoid valves	06 (ISO 4401)	D	DHAX4	350	60
3 way, poppet type, leak free, solenoid valves	06 (ISO 4401)	D	DLOHX6-**AO** DLOHX4-**AO** DLOKX4-**AO**	315 350 315	10 12 25
3 way, poppet type, leak free, solenoid valves	no	P	DLOPX6-**AO**	315	220
relief valve, direct screw-in	no no no	D	SP-CART-MX-3 SP-CART-MX-6 SP-CART-AREX-20	350 350 400	2,5 40 (60 PED) 120 (150 PED)
relief valve, DIN cartridge	25 (ISO 7368)	P	SC LIX-2531* LIMMX-2/*	350	400

(1) D = direct operated; P = pilot operated

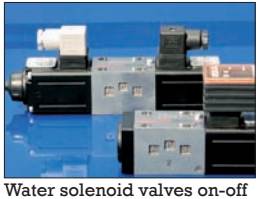
Stainless steels specifications

	DHAX DLOHX	SP-CART-*X HMPX
solenoid housing	AISI 630	-
valve body	AISI 316L	AISI 316L
internal parts	AISI 316L, 420B, 440C, 430F	AISI 316L, 420B, 630
springs	AISI 302	AISI 302
seals STD /PE	HNBR (buna) FPM (viton)	HNBR (buna) FPM (viton)



water electrohydraulics


Stainless steel cylinder


Water solenoid valves on-off & proportional

is designed for applications requiring uninflammability or intrinsic fluid eco-compatibility/non toxicity; internal parts in contact with fluid are made in stainless steel.

The term "water" refers to specific HFA Water based fluids or just pure water instead of common mineral or synthetic oils. The HFA emulsion is generally composed by a minimum of 95% of water and only 5% (or less) of oil

Water hydraulics is actually used in die-castings, steel plants and mining sectors. The water based fluids are also appreciated in several applications where the final products must not be tainted by accidental contact with fluid, for example in food, chemical and pharmaceutical industry

options & features

Atos components are customer-tailored to fulfil requirements of any application by a variety of special purpose options of different materials/seals & auxiliary devices

hydraulic fluids

Components included in this catalog are designed for oil-hydraulic systems, i.e. for suitable hydraulic fluids, as:

hydraulic fluids (1)	seals type
mineral oil HLP, HL-DIN 51524, vegetal oil HETG - VMDA 24568	NBR-buna
water glycol HFA, HFC - DIN 51502	/WG
phosp. ester HFD - DIN 51502, synt. ester HESS and polyglicol HEPG - VDMA 24568	/PE
special aeronautic SKYDROL - HyJet IV/V	/EP

(1) water glycol (/WG) and phosp. ester (/EP) fluids involve a reduction of performances, ask for specific information

special materials

Special materials are used for specific applications, for instance: spheroidal cast iron for pressure up to 500 bar, stainless steel for bodies and spools, non-magnetic execution for military, plastics/rubber for auxiliary parts

specific seals are applied as follows:

NBR-buna	standard for mineral & vegetal hydraulic oil
/WG	special NBR-buna for water glycol fluids
/PE	FKM-Viton for phosphate esther HFD fluids & high temperature
/EP	EPDM-ethylene propylene for special aeronautic fluids

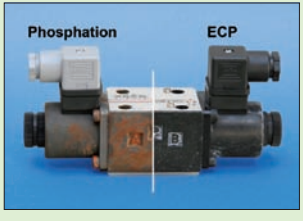
low temperature

Low temperature components **/BT** are supplied to withstand ambient temperature down to -40°C, they derive from standard versions by using stainless steel springs plus specific HNBR seals

enhanced corrosion protection

ECP - Enhanced Corrosion Protection - is applied to all Atos valves to grant high rust resistance in open air / aggressive environments and in long-term storage.

A valuable plus, it consists of zinc plating with black passivation of bodies, anodizing, Geomet, plastic encapsulation and conforms to RoHS Directive 2002/95/CE, Cr+6 free.



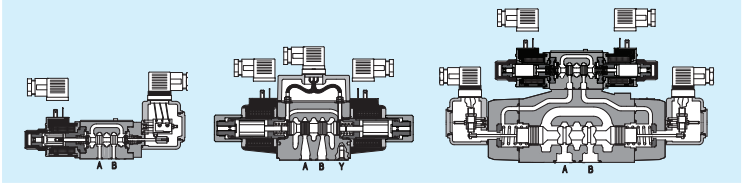
Photos at side show a valve after 120 hours testing in salt spray chamber …without-with ECP treatment

safety solenoid valves

To ensure safety and avoid uncontrolled movement of actuators Atos range is TÜV certified to Machine Directive 2006/42/CE and includes specific optional devices for monitoring spool position and the relevant hydraulic status, the output signal means "intercepted line" or "not intercepted line".
Two basic executions: /FI inductive proximity - /FC mechanical microswitch

DH-0611/FI

DKE-1751/FC

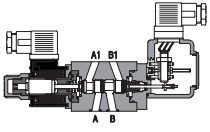


model ISO 4401		DH*-0	DK*-1	DPH*-2	DPH*-3
size		6	10	16	25
solenoid type		I - U -O	E - ER	I - U	I - U
max pressure at T port	FI	5	5	250	250
	FC	20	20	250	250

details on table E110

modular safety valves

to be modular staked with size 06 solenoid valves



model		HF	HF*/FI
size		06	
max flow - l/min		60	
Pmax - bar	P, A, B port	350	
	T port	120(I) 210(U)	20

details on table TD030

leak free valves

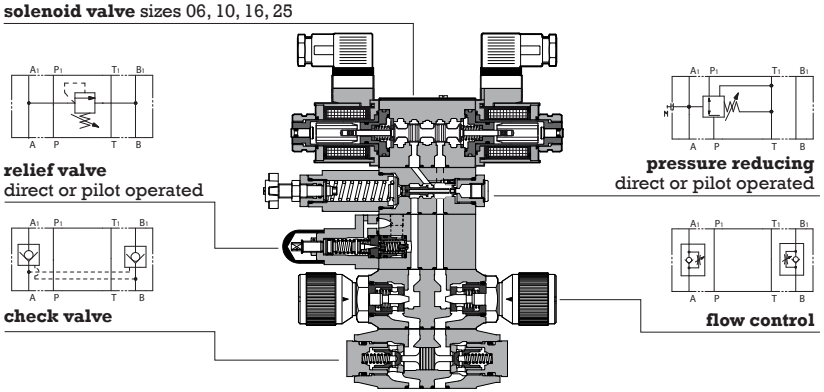
Size 06 valves in 2- or 3- way execution used to cut off the line of hydraulic power to an actuator or to grant the fixed position of vertical actuator's in case of maintenance, emergency, safety situations

details on table E041

		DLOH-2	DLOH-2C	DLOH-3A	DLOH-3C	DLOK-3A	DLOK-3C
nominal flow		12				30	
Pmax - bar	P, A, B port	350				315	
	T port	160				210	
internal leakages		less than 5 drops/min (<0,36 cm³/min) at max pressure					
electrical power DC - W		33				32	

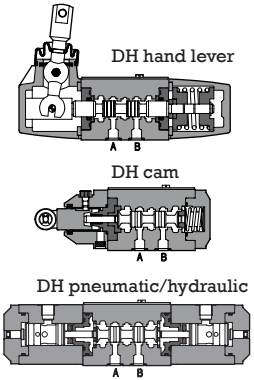
modular valves

full line of ISO 4401 valves, to be staked with ISO solenoid valves



directional valves

hand lever, cam, pneumatic/hydraulic operated



model description		size 06	size 10	size 16	size 25	symbols
hand lever	2 positions	DH-013	DK-113	DP-213	DP-313	
	2 position + detent	DH-015	DK-115	DP-215	DP-315	
	3 positions	DH-011	DK-111	DP-211	DP-311	
	3 position + detent	DH-014	DK-114	DP-214	DP-315	
cam	2 positions	DH-02	DK-12	-	-	
hydraulic	2 positions	DH-04	DK-14	DP-24	DP-34	
	3 positions	DK-051	DK-151	DP-251	DP-351	
	2 position + detent	DK-055	DK-155	-	-	
pneumatic	2 positions	DH-08	DK-18	DP-28	DP-38	
	3 positions	DH-091	DK-191	DP-291	DP-391	
	2 position + detent	DH-095	DK-195	DP-295	DP-395	

first class facilities

modern factories
advanced machinery

1 Atos headquarters in Sesto Calende, Italy, a town close to Alps at shore at Lago Maggiore • **2-5** machining by CNC transfers with robot loading • **6** washing & thermal deburring • **7** precise honing of valve's bodies • **8** laser welding for solenoids & spools • **9** 3D micrometric control • **10** valves assembly lines • **11** assembly & testing of cylinders • **12-13** shipping & storage depts • **14-15** electronic dept • **16** CNC testing of proportionals

QUALITY SYSTEM ISO 9001 CERTIFIED

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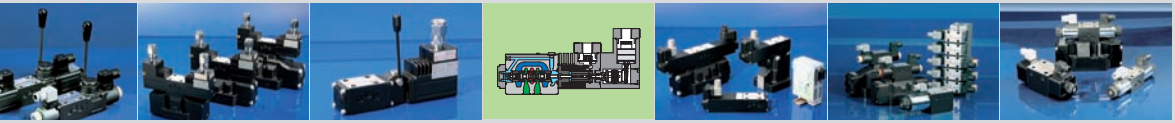

solenoid valves

Atos spa

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TE12-1/E