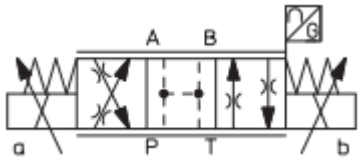
atos
the smart electrohydraulics

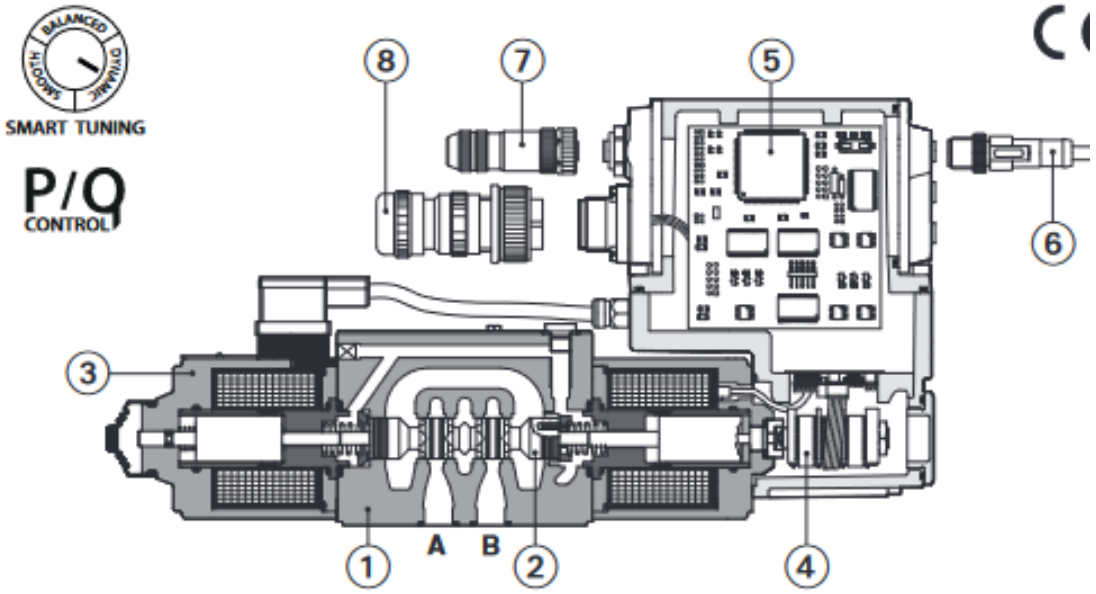
Service Center Training

TE / LE* valves*

DKZOR-TEB-170-L5*



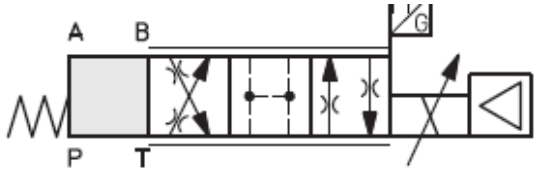
Digital servoproportional directional valves, **direct**, with **LVDT** position transducer and **zero spool overlap** for position closed loop controls. The double solenoid construction involves larger flows and central safety rest position.



DKZOR-TES-SN-BC-170

① Valve body
② Spool
③ Proportional solenoid
④ LVDT transducer
⑤ On-board digital driver
⑥ USB connector
⑦ Fieldbus connectors
⑧ Main connector

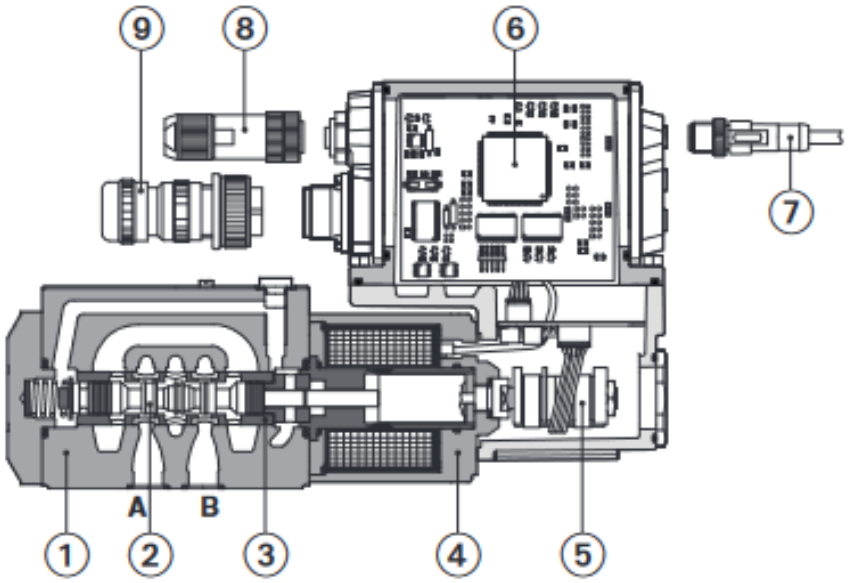
DLHZO-TEB-040-L3*



Servoproportional direct operated digital proportional valves **in sleeve execution** with **LVDT** position transducer and zero spool overlap for best performances in any position closed loop control.

SMART TUNING

P/Q CONTROL



DLKZOR-TES-SN-BC-160

① Valve body
② Spool
③ Sleeve
④ Proportional solenoid
⑤ LVDT transducer
⑥ On-board digital driver
⑦ USB connector
⑧ Fieldbus connector
⑨ Main connector

DLHZO	-	TES	-	SN	-	NP	-	0	40

DLHZO = size 06
DLKZOR = size 10

TEB = basic on-board digital driver
TES = full on-board digital driver

Alternated P/Q controls, see section 7:
SN = none
Only for TES:
SP = pressure control (1 pressure transducer)
SF = force control (2 pressure transducers)
SL = force control (1 load cell)

IO-Link interface, only for TEB, see section 5:
NP = Not present **IL** = IO-Link

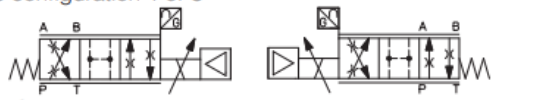
Fieldbus interfaces, only for TES, see section 6:
NP = Not present
BC = CANopen **EW** = POWERLINK
BP = PROFIBUS DP **EI** = EtherNet/IP
EH = EtherCAT **EP** = PROFINET RT/IRT

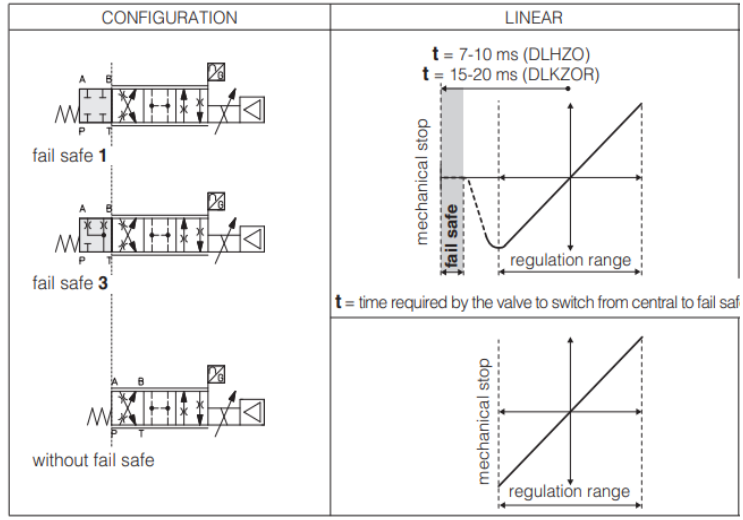
Valve size ISO 4401: **0** = 06 **1** = 10

Configuration:

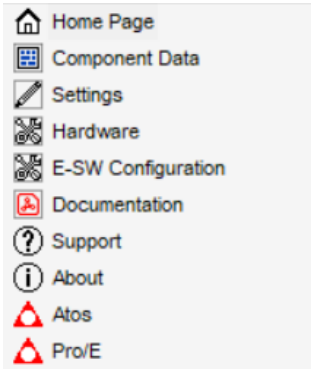
40 = with fail safe configuration 1 or 3

60 = without fail safe

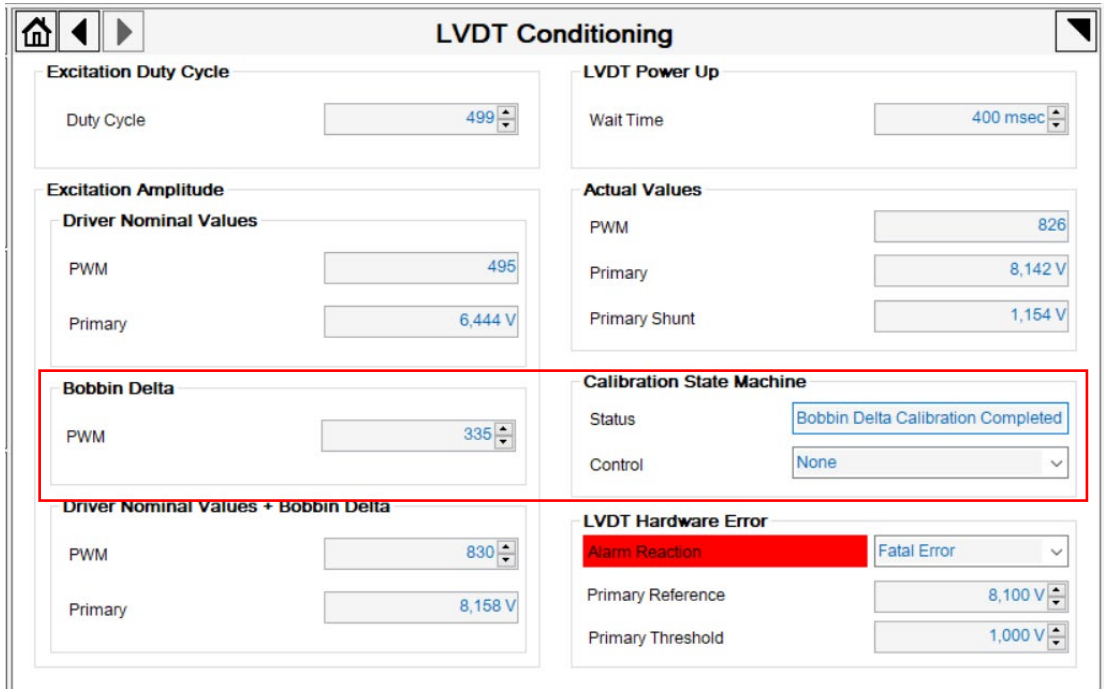




Coupling of driver and S.20 transducer



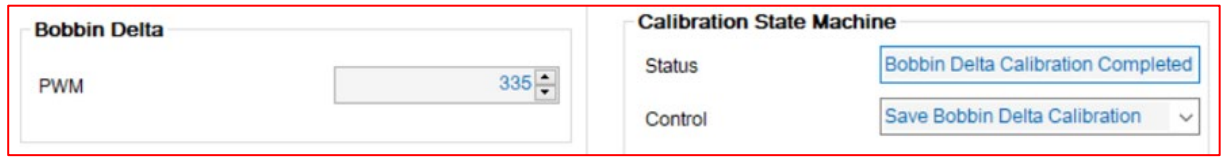
- Settings
  - Flow
    - (Pilot)
      - LVDT Conditioning



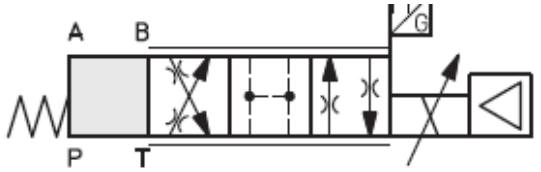
1.

2.

3.



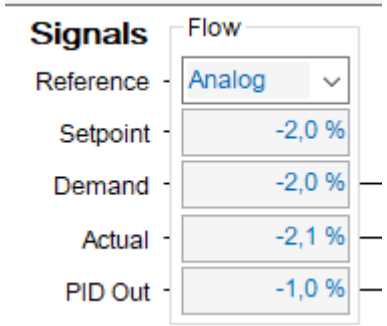
TESTING PROCEDURE



- Check the calibration code and the valve name
- Flushing 3/5 min with triangular/sine wave
- Calibration of the valve
- Check response times (overshoots, velocity, shape of curves..)
- Check bode diagrams (if possible)

ZERO spool overlap

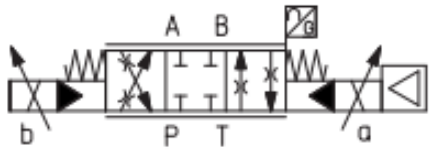
1. Static conditions
2. Line pressure 100 bar
3. INT REF = 0%
4. Pressure(A) = Pressure(B)
5. Move and check again



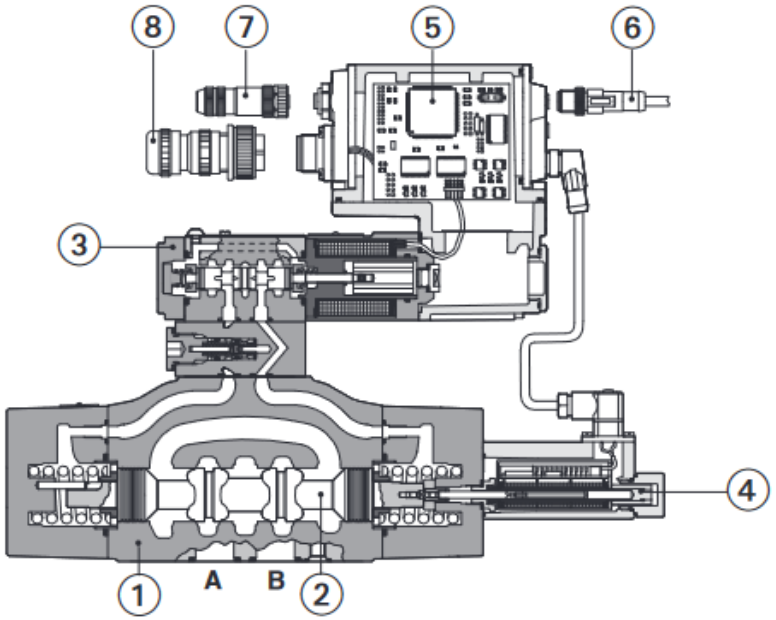
POSITIVE spool overlap

1. State machine: Disable
2. Valve signal actual → 0%

DPZO-TEB-271-L5

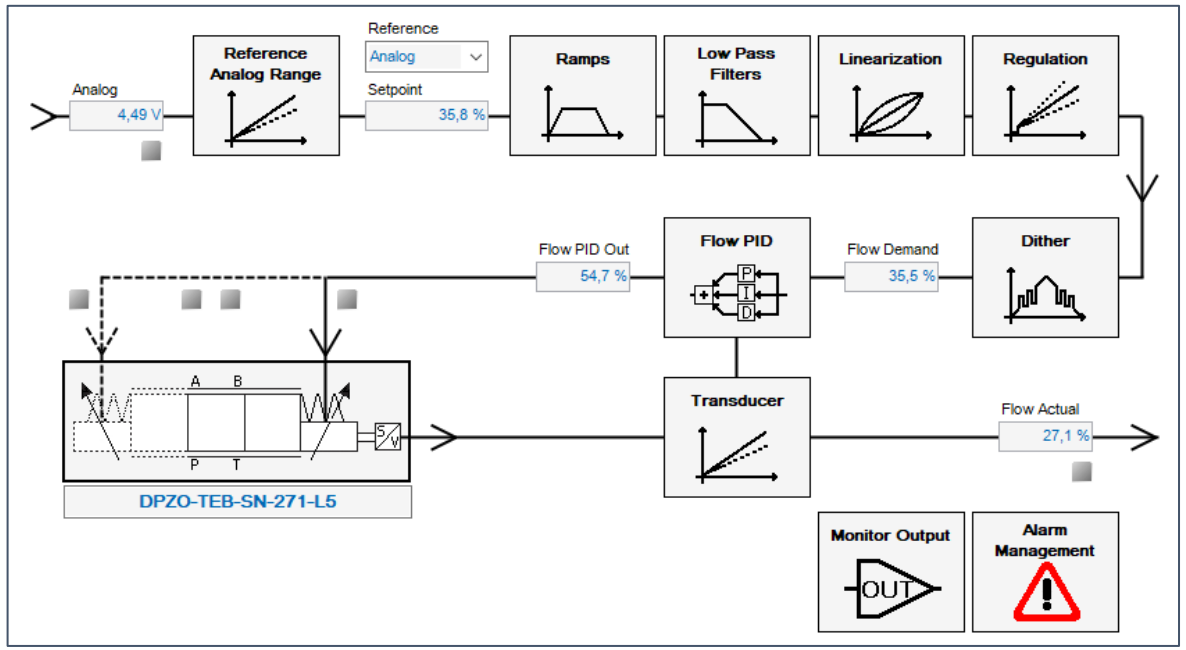


Digital proportional directional valves, **piloted**, specifically designed for directional and speed controls. They are equipped with **one LVDT** position transducer (main stage) and **positive spool overlap** for best dynamics in directional controls and not compensated flow regulations.

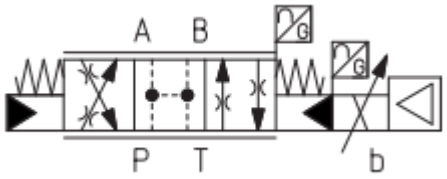


DPZO-TES-SN-BP-251

① Valve body
② Main stage Spool
③ Pilot valve
④ Main stage LVDT transducer
⑤ On-board digital driver
⑥ USB connector
⑦ Fieldbus connectors
⑧ Main connector



DPZO PILOTING and DRAIN CHANNELS



Standard : internal piloting and external draining

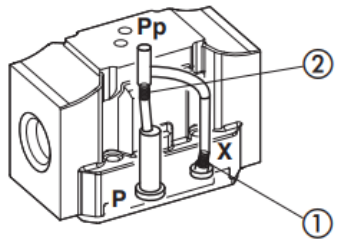
/ * * / *

Seals material, see section 12 :
- = NBR
PE = FKM
BT = HNBR

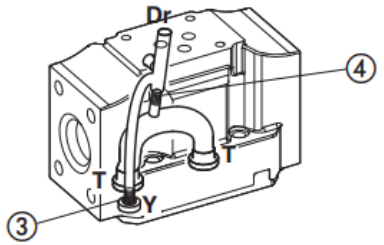
Series number

Hydraulic options (3):
B = solenoid with on-board digital driver and LVDT transducer at side of port B of the main stage (side A of pilot valve)
D = internal drain
E = external pilot pressure
G = pressure reducing valve for piloting

DPZO-1 **Pilot channels**

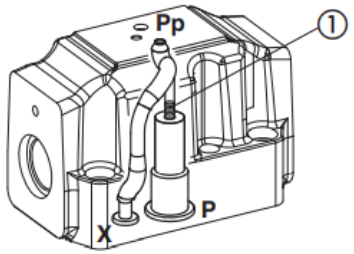


Drain channels

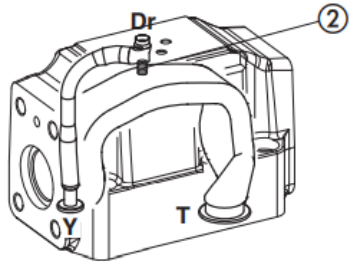


Internal piloting: blinded plug SP-X300F ① in X;
External piloting: blinded plug SP-X300F ② in Pp;
Internal drain: blinded plug SP-X300F ③ in Y;
External drain: blinded plug SP-X300F ④ in Dr.

DPZO-2 **Pilot channels**

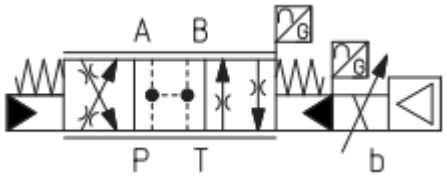


Drain channels



Internal piloting: Without blinded plug SP-X300F ①;
External piloting: Add blinded plug SP-X300F ①;
Internal drain: Without blinded plug SP-X300F ②;
External drain: Add blinded plug SP-X300F ②.

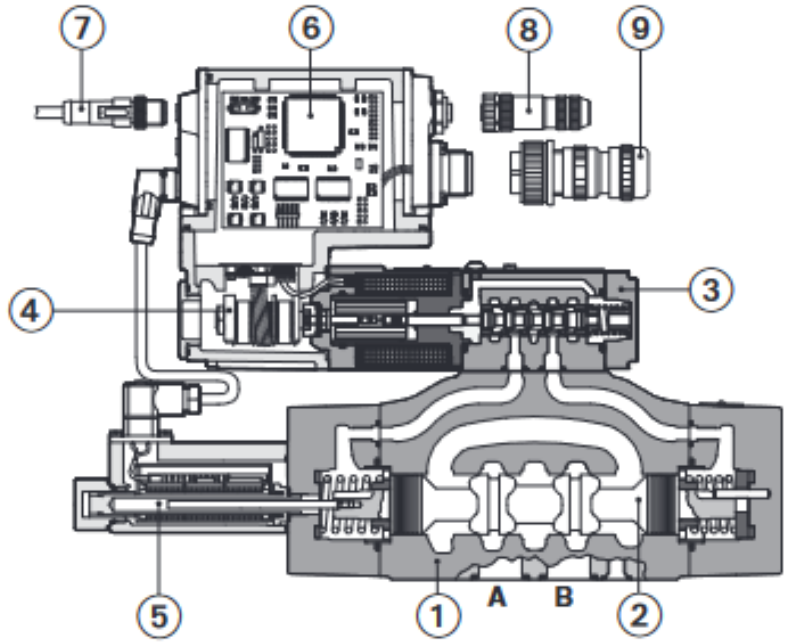
DPZO-LEB-270-L5



Digital servoproportional directional valves, **piloted**, with **two** **LVDT** position transducer and zero spool overlap for position closed loop controls.

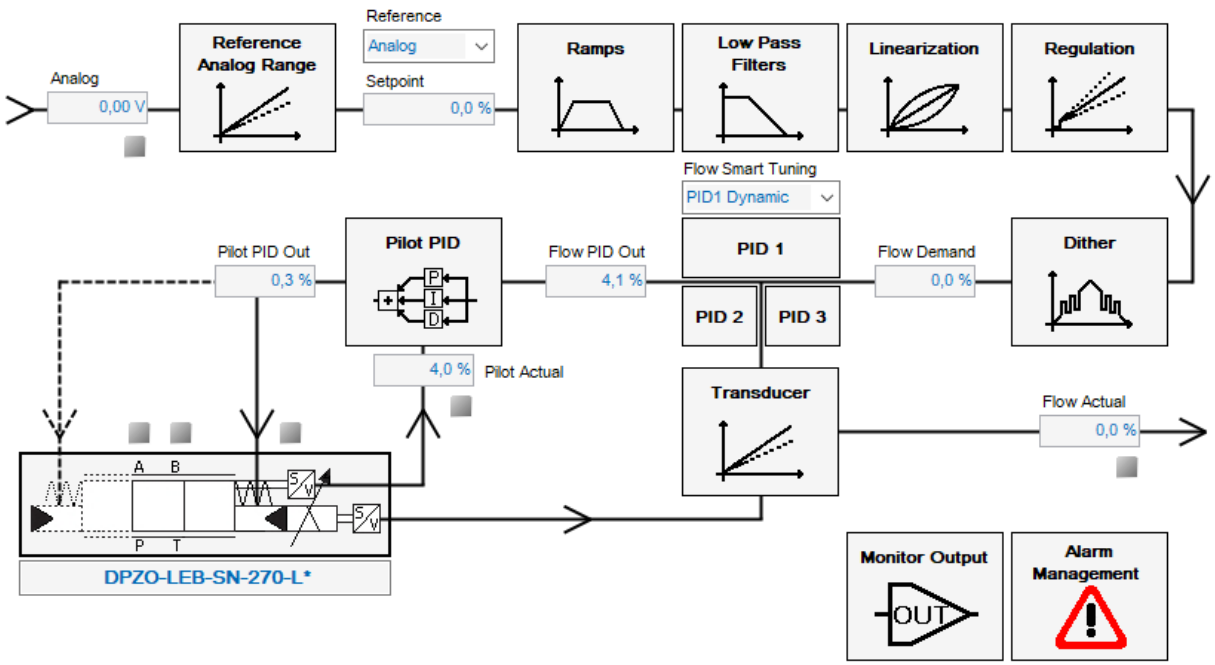
SMART TUNING

P/Q CONTROL



DPZO-LES-SN-BP-270

① Valve body
② Main stage Spool
③ Pilot valve
④ Pilot valve LVDT transducer
⑤ Main stage LVDT transducer
⑥ On-board digital driver
⑦ USB connector
⑧ Fieldbus connectors
⑨ Main connector



DPZO-LEB-SN-NP-270-L5

1 MODEL CODE

DPZO	-	LES	-	SN	-	NP	-	2	70	-	L	5	/	*	*	/	*

Servoproportional directional valve, piloted

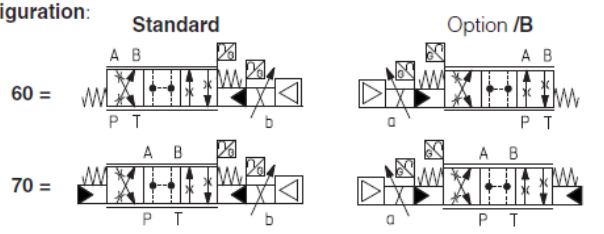
LEB = basic on-board digital driver **(1)**
LES = full on-board digital driver

Alternated P/Q controls, see section [6] :
SN = none
SP = pressure control (1 pressure transducer)
SF = force control (2 pressure transducers)
SL = force control (1 load cell)

Fieldbus interfaces, USB port always present:
NP = Not present
BC = CANopen
BP = PROFIBUS DP
EH = EtherCAT
EW = POWERLINK
EI = EtherNet/IP
EP = PROFINET RT/IRT

Valve size ISO 4401:
1 = 10 **2** = 16 **4** = 25 **4M** = 27 **6** = 32 **8** = 35

Configuration:



Series number

Seals material, see section [12] :
- = NBR
PE = FKM
BT = HNBR

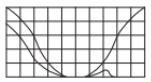
Hydraulic options (3):
B = solenoid with on-board digital driver and LVDT transducer at side of port B of the main stage (side A of pilot valve)
D = internal drain
E = external pilot pressure
G = pressure reducing valve for piloting

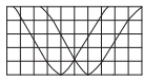
Electronics options (3):
C = current feedback for pressure transducer 4÷20mA (omit for std voltage ±10VDC) - only **LES-SP, SF, SL**
F = fault signal
I = current reference input and monitor 4÷20mA (omit for std voltage ±10VDC)
Q = enable signal
Z = double power supply, enable, fault and monitor signals - 12 pin connector **(4)**

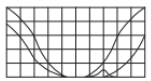
Safety options TÜV certified - only **LES (3)**:
U = safe double power supply
K = safe on/off signals
See section [8]

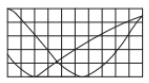
SAFETY CERTIFIED

L = lineare
S = progressiva
DL = differenziale-lineare P-A = Q, B-T = Q/2 P-B = Q/2, A-T = Q
D = differenziale-progressiva P-A = Q, B-T = Q/2 P-B = Q/2, A-T = Q

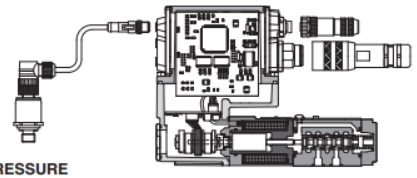

D9 Per circuito rigenerativo (è richiesta un'ulteriore valvola di ritegno esterna) vedere 15.1 - diagramma 26


Q5 Per il controllo P/Q alternato vedere 15.1 - diagramma 28

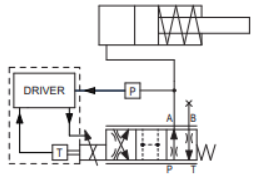

L9 Per circuito rigenerativo interno alla valvola vedere 15.1 - diagramma 27


V9 Per il controllo P/Q alternato del ciclo di iniezione in macchinari plastici vedere 15.1 - diagramma 29

SP - Pressure Control - 1 pressure transducer

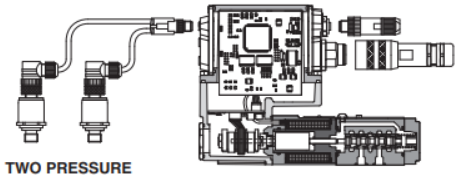


e.g. DLHZO-TES- **SP** -BP PROFIBUS DP

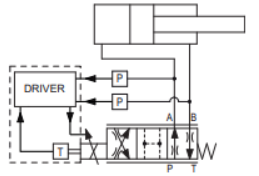


one remote pressure transducer has to be installed on the actuator's port to be controlled.
In this example the SP option regulates the pressure on port A

SF - Force Control - 2 pressure transducers

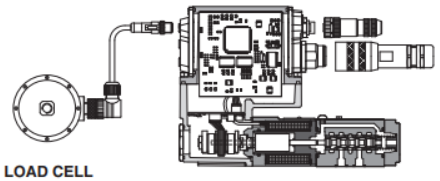


e.g. DLHZO-TES- **SF** -EH EtherCAT

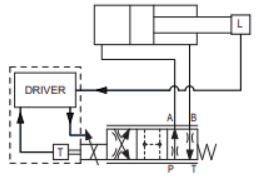


two remote pressure transducers have to be installed on the actuator's ports A and B.
The bore and rod dimensions of the actuator have to be input into the valve software, which calculates the relevant areas:
A1 = bore area; A2 = ring area
The SF option directly controls the actuator force (F) as result of the following calculation:
F = (Pa x A1) - (Pb x A2)

SL - Force Control - 1 load cell

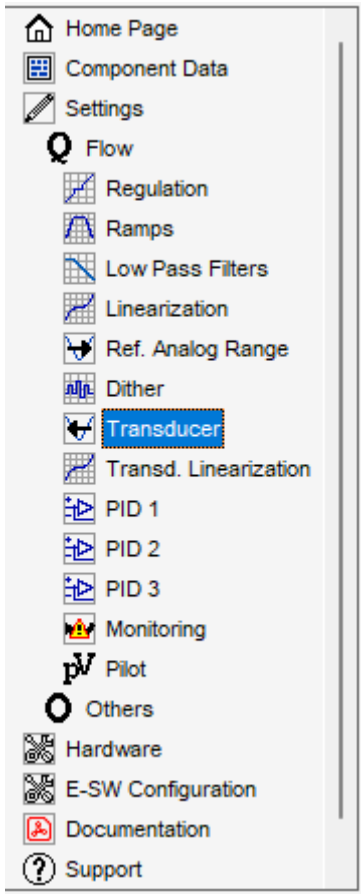


e.g. DLHZO-TES- **SL** -EW POWERLINK

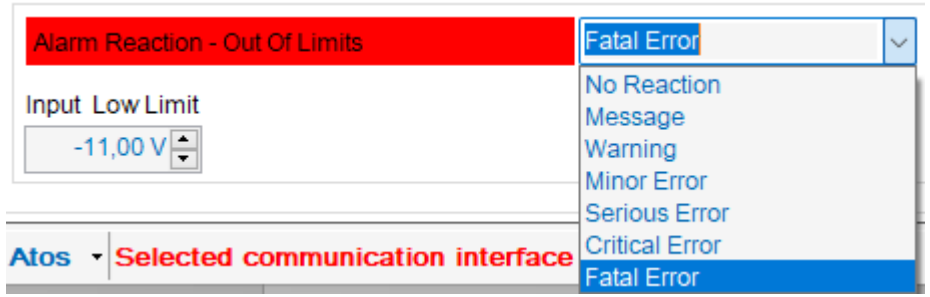


one load cell transducer has to be installed between the actuator and the controlled load
The SL option directly control the actuator force

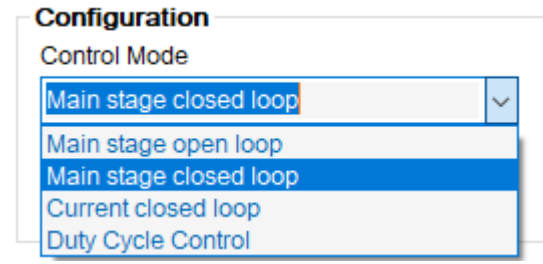
CALIBRATION OF PILOT VALVE



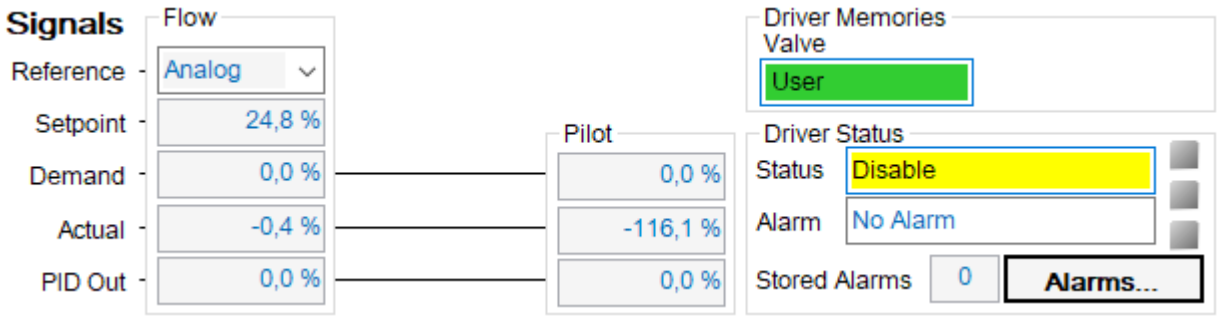
- TRANSDUCER



- COMPONENT DATA



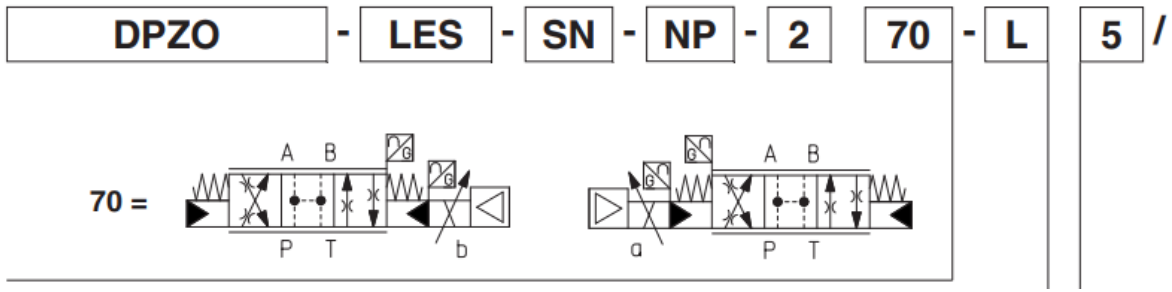
- ALARMS
  - CLEAR HISTORY



- TEST THE PILOT VALVE

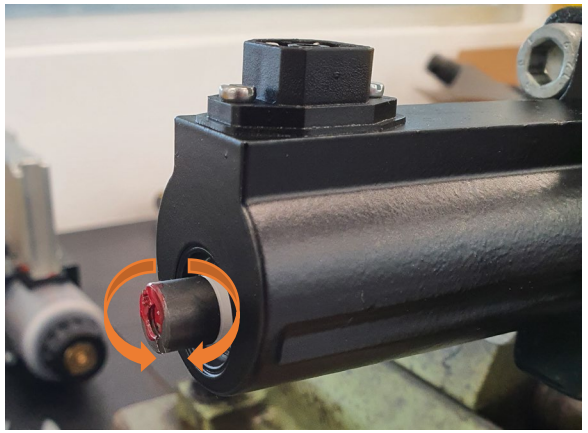
ZEROING OF DPZO VALVES

ZERO SPOOL OVERLAP

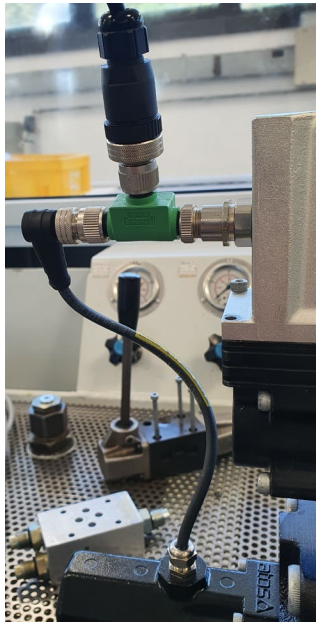


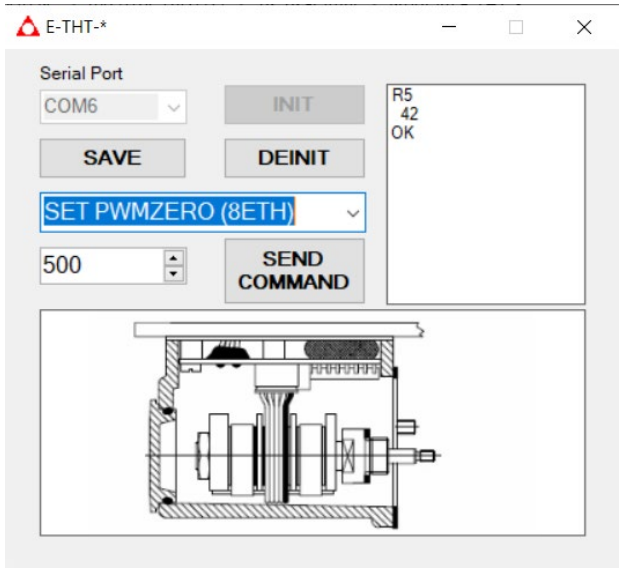
- Static conditions
- Set pressure = 100 bar
- INT REF = 0%
- Pressure(A) = Pressure(B)
- Move and check again

S. 10 transducers



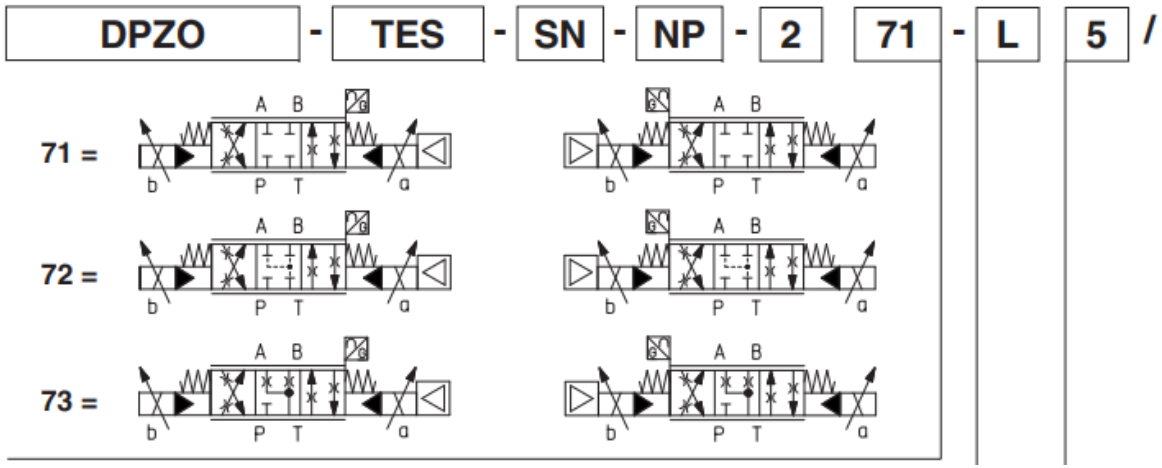
S. 20 transducers



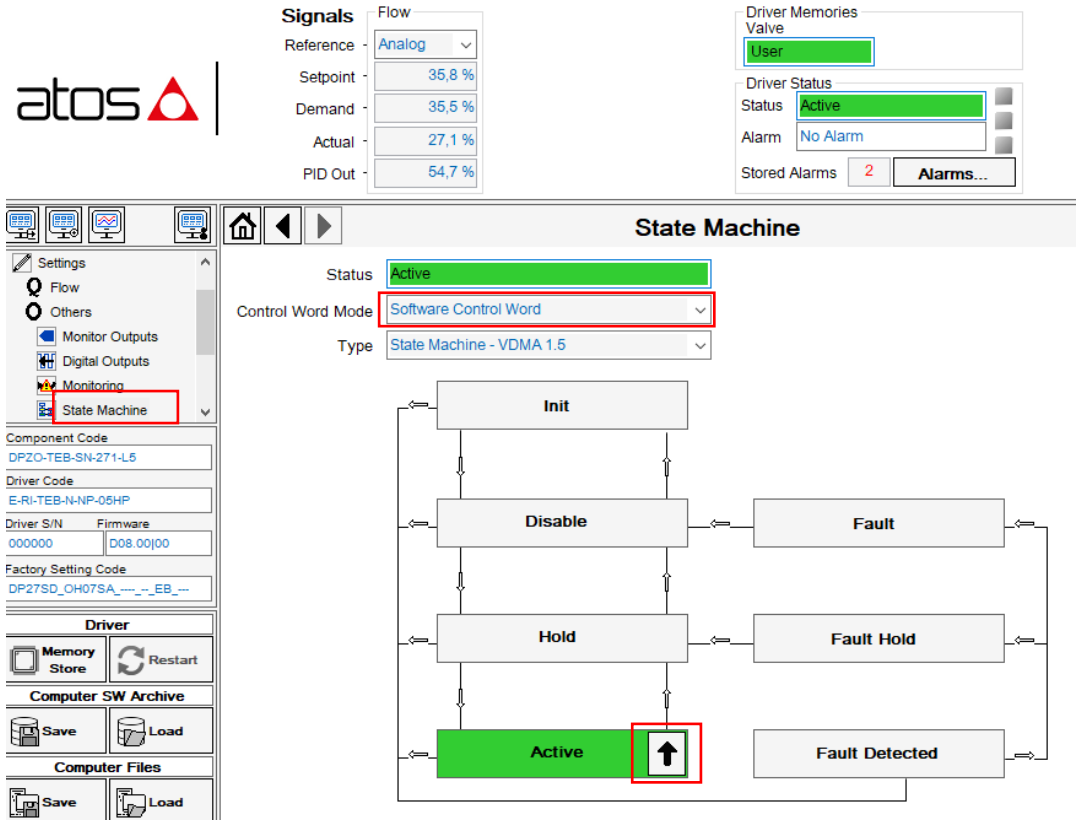


ZEROING OF DPZO VALVES

POSITIVE SPOOL OVERLAP



- State machine: Disable
- Valve signal actual → 0%



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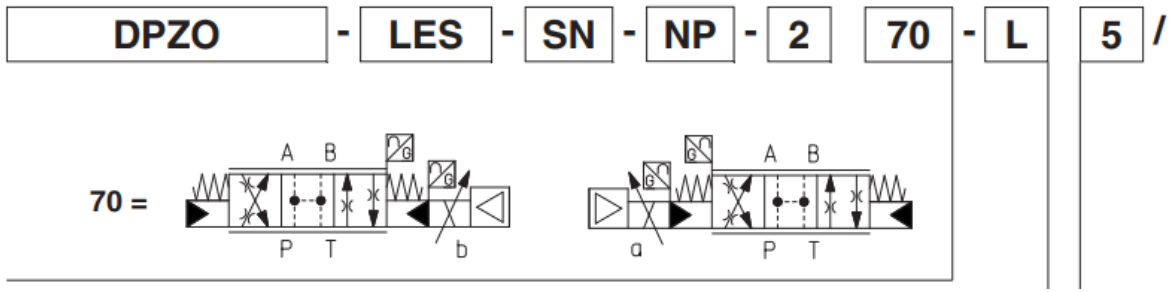
Service Center Training

Zeroing of DPZO transducer

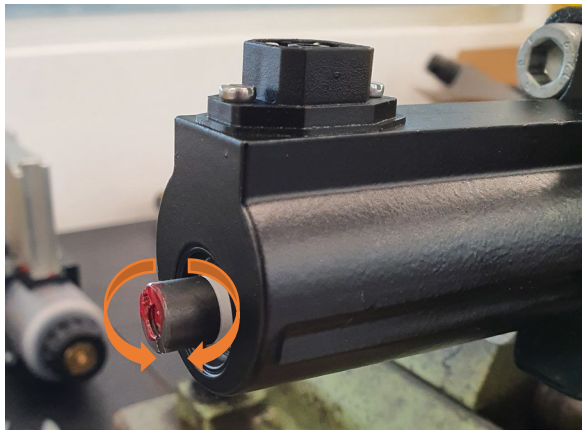
ZEROING OF DPZO VALVES

ZERO SPOOL OVERLAP

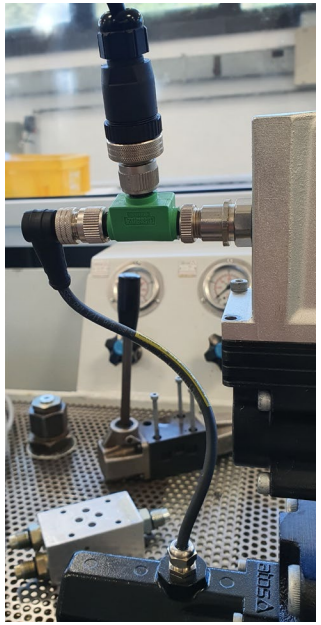


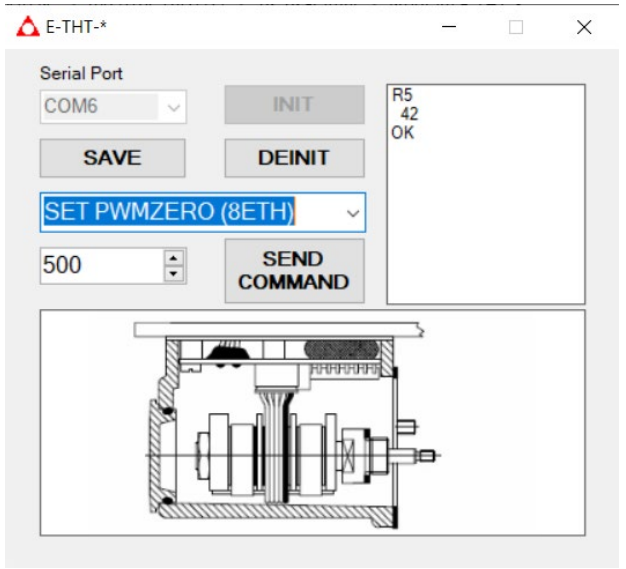
1. Static conditions
2. Set pressure = 100 bar
3. State machine: Init
4. Pressure(A) = Pressure(B)
5. Move and check again

S.10 transducers



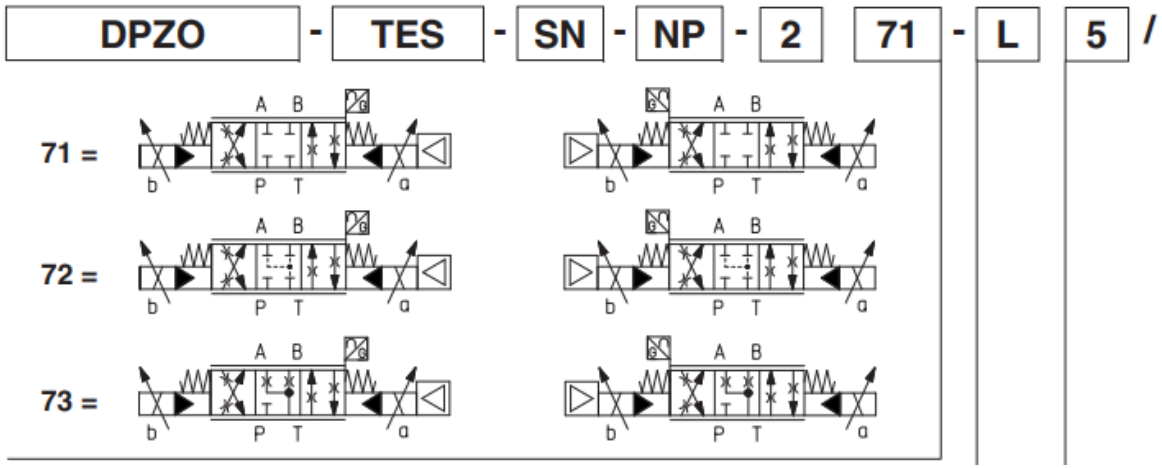
S.20 transducers



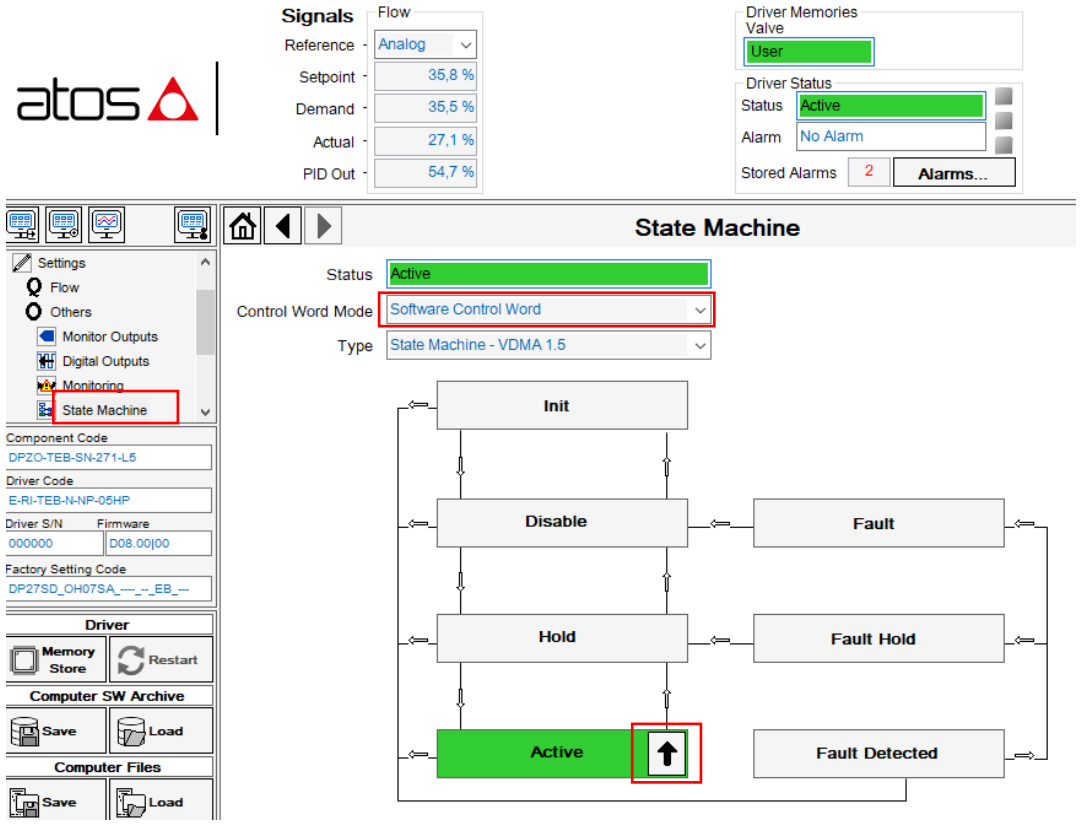


ZEROING OF DPZO VALVES

POSITIVE SPOOL OVERLAP



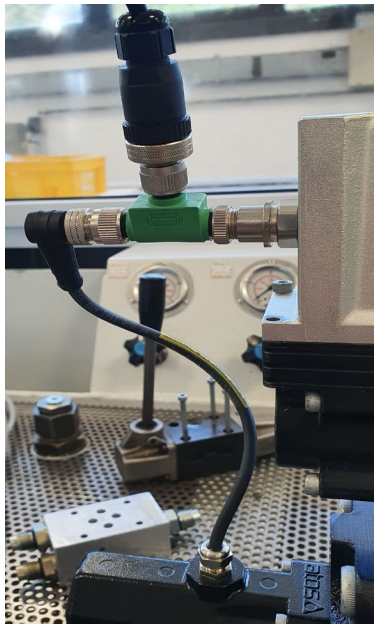
1. State machine: Init
2. Valve signal actual → 0%

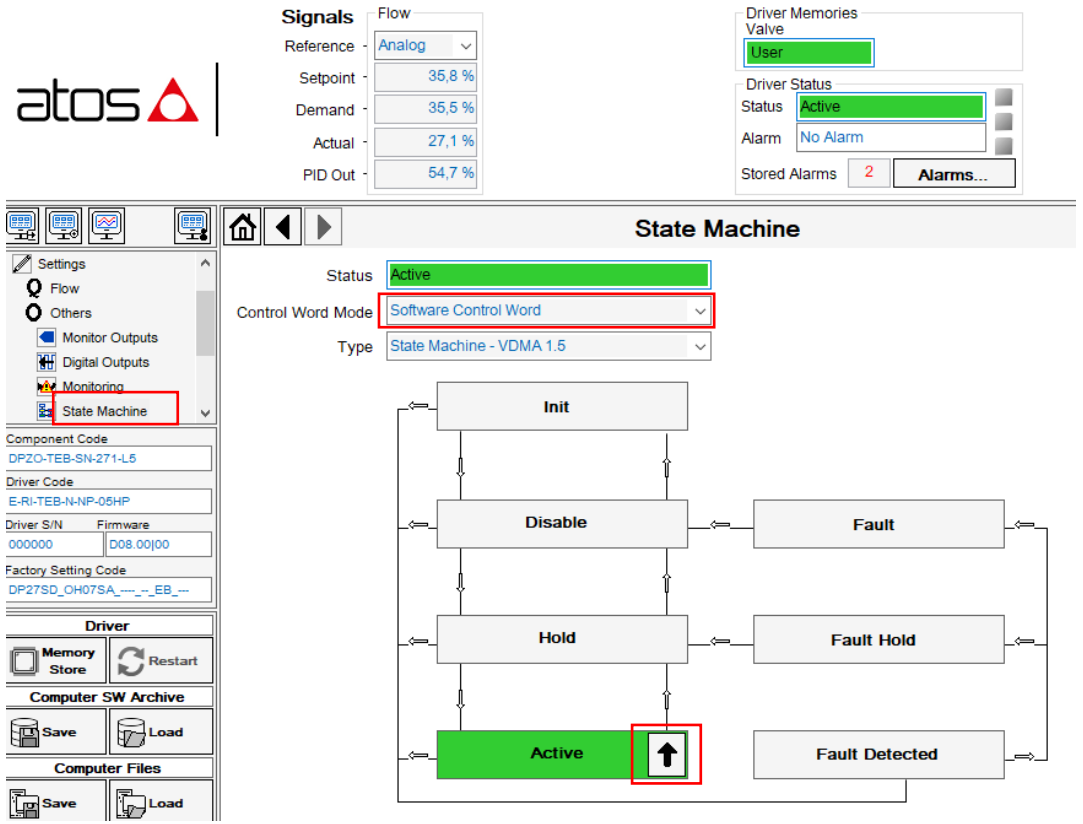


ZEROING OF DPZO VALVES

POSITIVE SPOOL OVERLAP

S.20 transducer connections

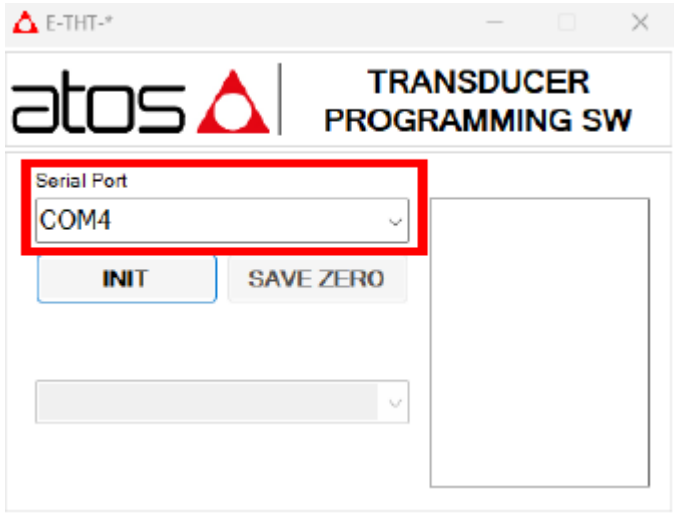


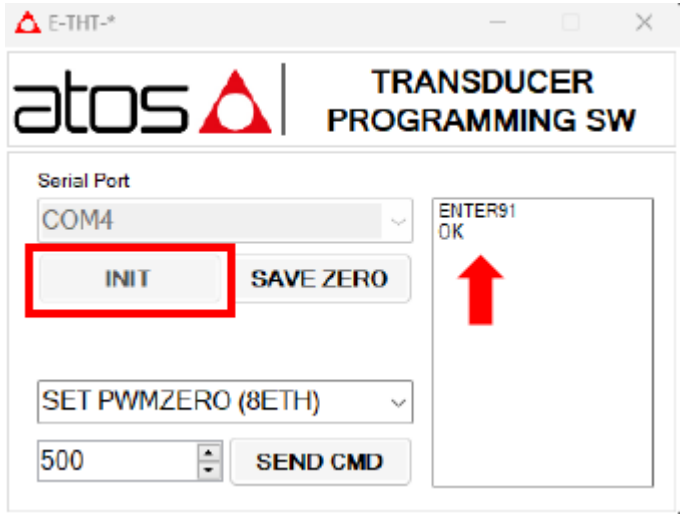


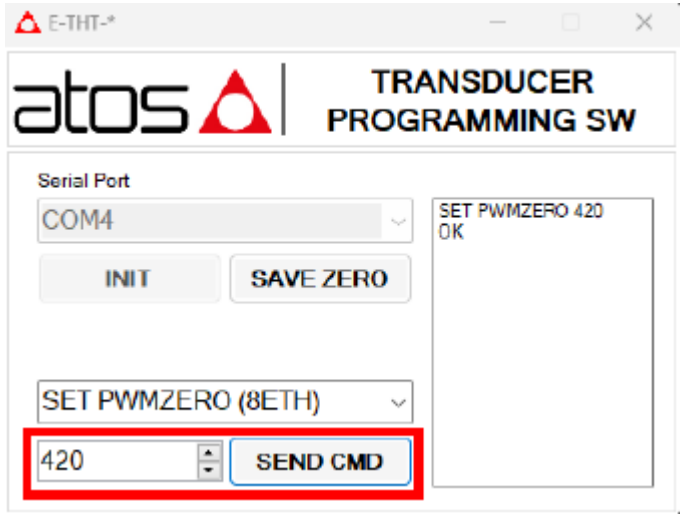
1. Connect properly transducer and driver
2. State machine: Init

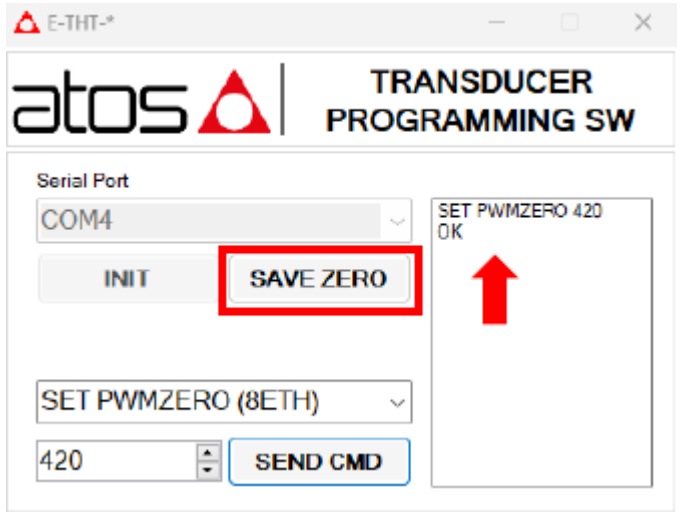
ZEROING OF DPZO VALVES

POSITIVE SPOOL OVERLAP









1. Connect properly transducer and driver
2. State machine: Init
3. Valve signal actual → 0%

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E-THT-8 TRANSDUCER ANTI-ROTATION SYSTEM ASSEMBLY INSTRUCTIONS

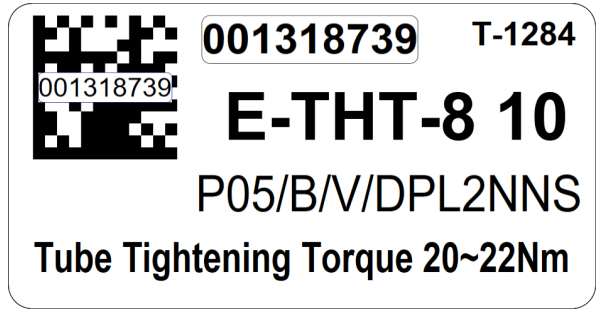
INTRODUCTION

Following the very few cases of leakage detected by ETHT-8 transducers, likely due to unexpected micromovement of this part, Atos identified an **anti-rotation system** useful to definitively avoid such phenomenon.

This additional improvement has already been introduced as per standard solution on LIQZP* valves up to Size 40 and to all the DPZO* proportional valves running production beginning from April 2024.

E-THT-8 10 PREVIOUS LABEL

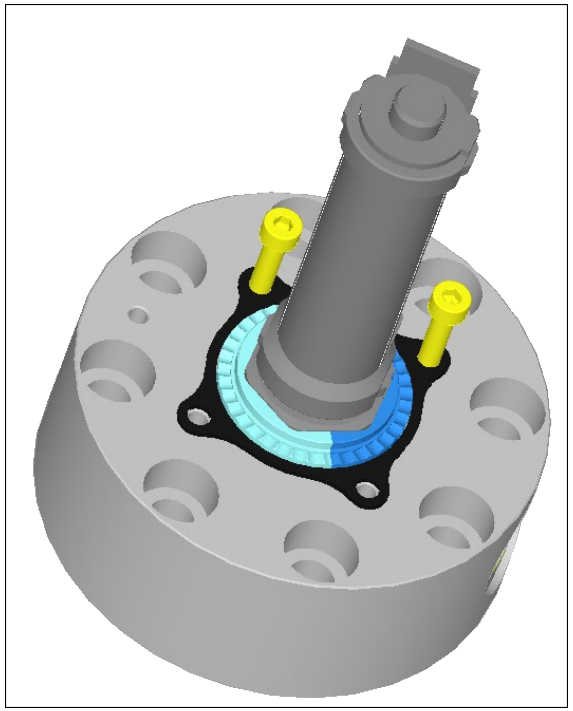
E-THT-8 10 NEW LABEL SINCE THE INTRODUCTION OF THE ANTI-ROTATION SYSTEM

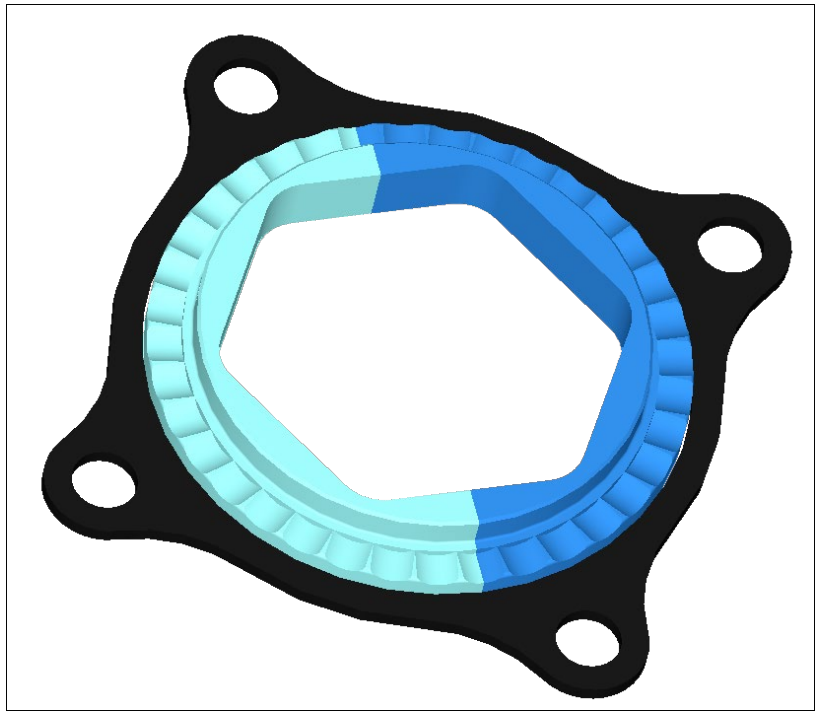


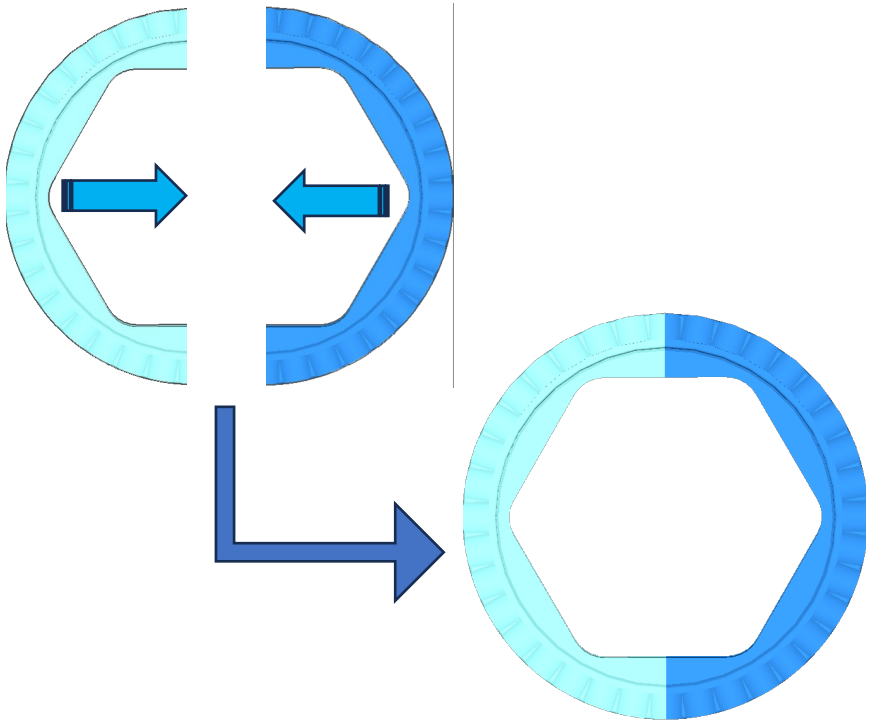
To be taken into account that this solution has been developed with the aim to be easily applied on the valves already in the Field to solve or to prevent possible leakages phenomenon.
Dedicated instructions below.

System technology

The anti-rotation solution is basically composed by **x2 knurled half-rings** with an internal hexagonal shape.
The whole system is kept in position and locked to the valve by the standard transducer protection.
Finally, a new shaped gasket replaces the previous O-ring to ensure IP protection.



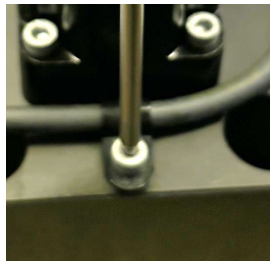




Assembly instructions

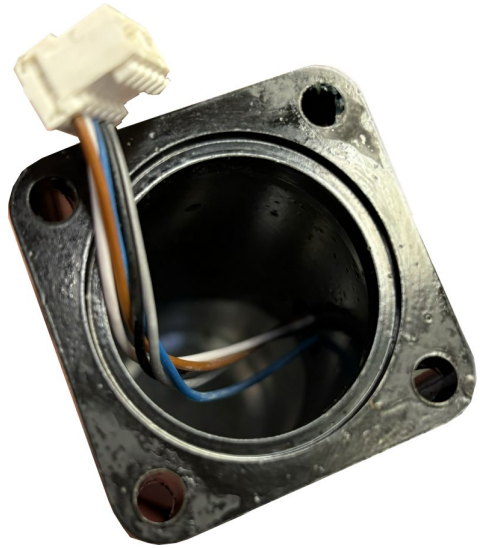
HOW TO ASSEMBLY THE ANTIROTATION SYSTEM ON AN ALREADY EXISTING VALVE

1. disconnect the transducer connector from the Driver
2. remove the transducer protection by unscrewing the x4 M4X20 fixing bolts



Remember to firstly remove the cable guide

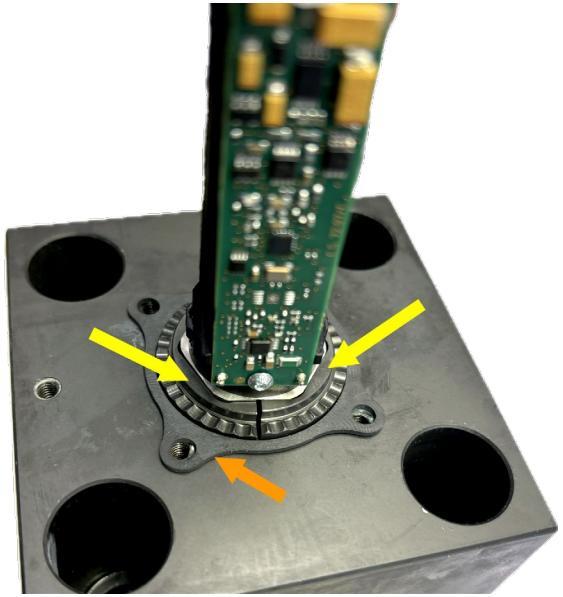
3. gently remove the transducer connector



Assembly instructions

4. WITHOUT REMOVE THE E-THT-8 TRANSDUCER, assembly the:

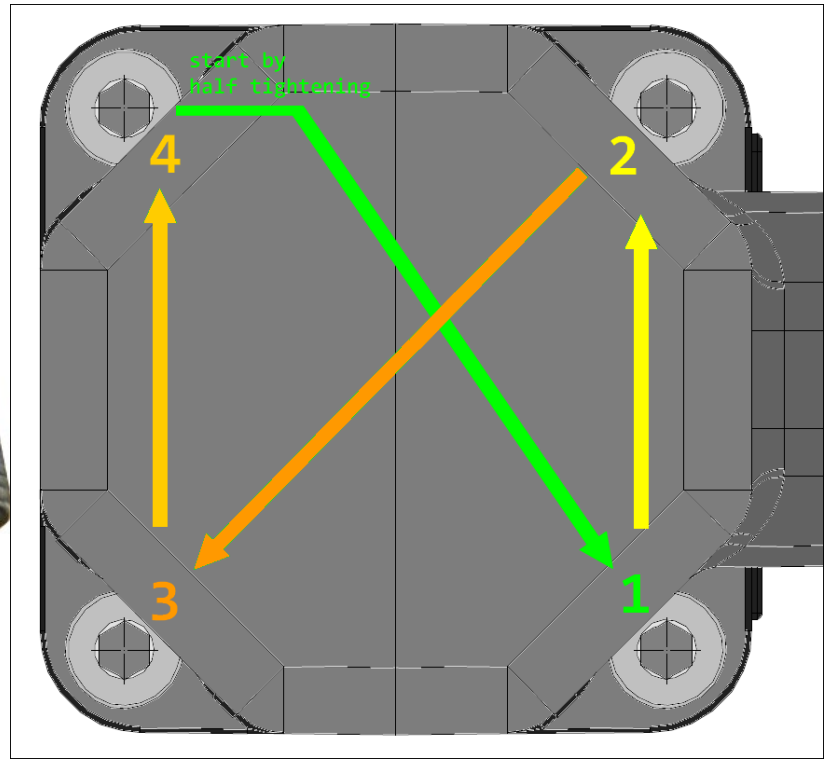
- x2 **knurled half-rings** around the hexagon without taking care of their position
- 1 shaped Rubber gasket taking care to align the x4 holes to the cap existing ones



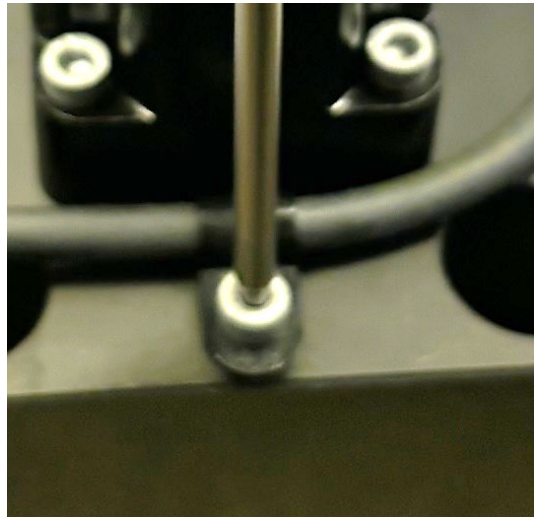
5. re-connect the transducer connector

Assembly instructions

6. re-assembly the transducer protection by using the original x4 M4X20 after having applied Loctite 242.
Apply 5÷5.5 Nm Torque Force, cross tightening the fixing screws



7. secure the cable guide



8. Record and share to Atos HQ the Matrix and the Serial number of the reworked valve /s

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