Neles™ NDX™ intelligent valve controller, standard model

Neles NDX is the next generation intelligent valve controller working on all type of control valves and in all industry areas. It guarantees end product quality in all operating conditions with incomparable performance, unique diagnostics, and years of reliable service. The NDX is a future-proof investment with life-time support for asset management.

Total cost of ownership

- Fast and reliable installation process
- Low energy and air consumption
- Easy to use diagnostics simplify determining when valve maintenance is required
- Inherent high air capacity eliminates additional instrumentation
- One positioner that fits to all control valves; small and big, rotary and linear, single and double acting
- Available for intrinsically safe and flameproof applications

Key features

- Reliable and robust design
- Industry leading pneumatic capacity
- Benchmark control performance
- Simple and fast installation and commissioning
- Valve stroke length up to 220 mm
- Local / remote operation
- Wide language support
- Expandable architecture
- HART (version 7 and 6) or Foundation Fieldbus communication
- Premium device diagnostics including:
  - Self-diagnostics
  - Online diagnostics
  - - History trends
  - Performance diagnostics
  - Communication diagnostics
  - Extended off-line test capabilities
  - Performance view
  - Online Valve Signature
- Worldwide support for hazardous area approvals

Options

Following options are available for NDX valve controller:

- Internal 4-20 mA position transmitter (in HART version only)
- Two digital outputs (NAMUR type) (in HART version only)
- Gauge block

Minimized process variability

- Linearization of the valve flow characteristics
- Excellent dynamic and static control performance
- Fast response to control signal change
- Accurate internal measurements

Easy installation and configuration

- Simple / fast configuration and calibration using one of the following:
  - Standard Local User Interface (LUI) accessible without opening the device cover
    - LUI can be rotated according to mounting position
  - Distributed Control System (DCS) asset management program
- Backwards compatible with retrofit kits for easy replacement of Neles NE700 and ND9000 positioners
- Easy retro-fit to an extensive list of 3rd party control valves
- Installation to all common control systems

Open solution

- Valmet is committed to delivering products that freely interface with software and hardware from a variety of manufacturers; NDX is no exception. This open architecture allows the NDX to be integrated with other field devices to give an unprecedented level of controllability.
- FDT and EDD based multi-vendor support configuration
- Support files for NDX are available from www.valmet.com/ndx

NDX mounting on actuators and valves

- Supports all single and double acting pneumatic actuators
- Both rotary and linear valves (up to 220 mm stroke)
- Guided startup and automatic/manual/1-point calibration

NDX in fieldbus networks

- Approved interoperability
- Host interoperability ensured
- Foundation fieldbus ITK version 6.5.0 certified
- Excellent maintainability with firmware download feature
- Digital communication via the fieldbus includes not only the set point, but also the position feedback signal from the position sensor.
- No special supplementary modules for analog or digital position feedback are needed when using the fieldbus valve controller.
- Back up LAS functionality available in Foundation Fieldbus environment
- Input selector and output splitter blocks available in Foundation Fieldbus devices allowing advanced distributed control
- Standard function blocks enables the freedom to use NDX intelligent valve controller either in continuous or on-off control applications
- Open and close information directly available via the fieldbus
- Open and close detection is based on position measurement information

Product reliability

- Designed to operate in harsh environmental conditions
- Rugged modular design
- Excellent temperature characteristics
- Vibration and impact tolerant
- IP66 enclosure
- Protected against humidity
- Resistant to dirty air
- Wear resistant and sealed components
- Fully contactless and maintenance free position measurement
- Fully encapsulated electronics

Predictive maintenance

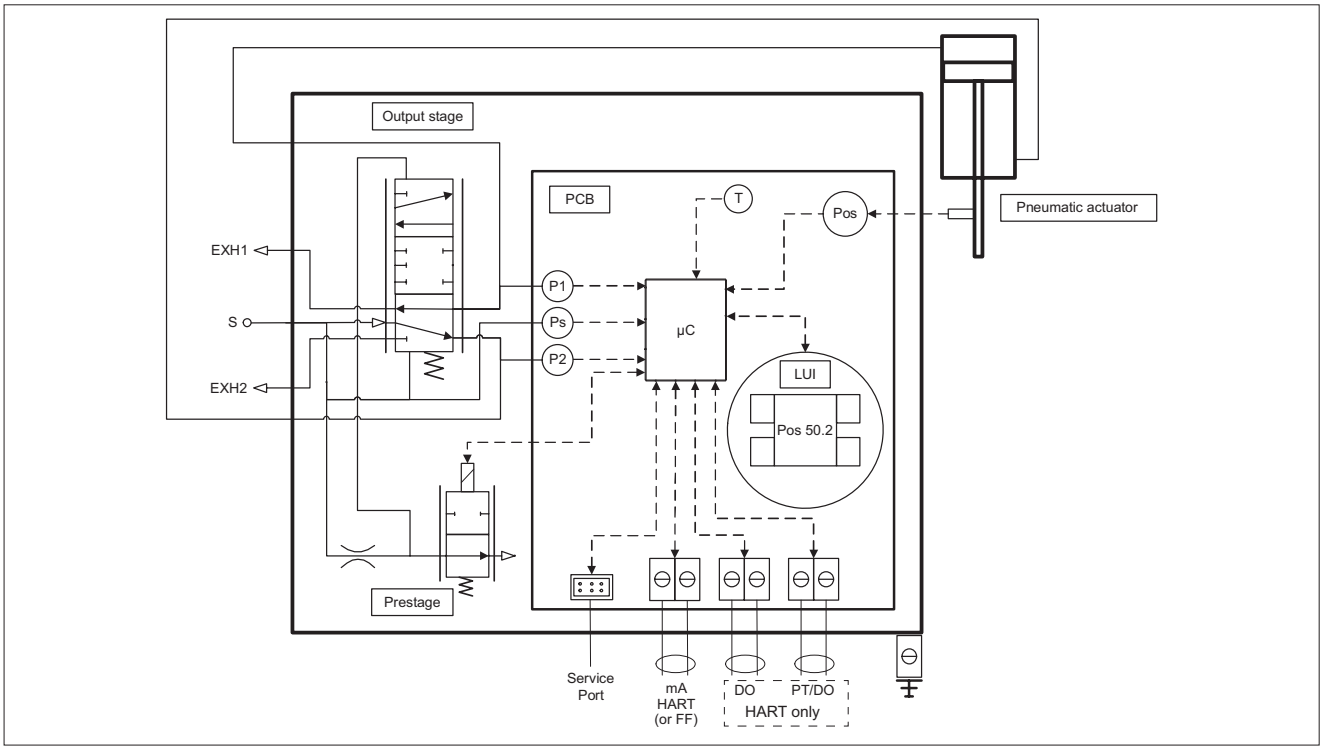
- Easy access to collected data with any FDT/DTM software and drivers
- Intelligent diagnostics analysis to visualize control valve health and performance
- Patented on-line valve signature
- Logical trend and histogram collection
- Diagnostics collected continuously while the process is running
- Extensive set of off-line tests with accurate key figure calculations
- Clear notifications with on-line alarms
- Condition monitoring tools available

Technical description

NDX_H_ is a 4–20 mA powered with HART communication and NDX_F_ is a fieldbus powered with FOUNDATION Fieldbus communication microcontroller based intelligent valve controller.
The device contains a local user interface enabling configuration and operation without opening the device cover. Configuration and operation can also be made remotely by PC with asset management software connected to the control loop.
After connections of electric signal and pneumatic supply, the micro controller continuously reads measurements:

- Input signal
- Valve position with contactless sensor
- Actuator pressure
- Supply pressure
- Device temperature

Advanced self-diagnostics guarantee that all measurements operate correctly.
Powerful microcontroller calculates a control signal for I/P converter. I/P converter (prestage) controls the operating pressure to the pneumatic relay (output stage). Pneumatic relay moves and actuator pressure changes accordingly. The changing actuator pressure moves the control valve. The position sensor measures the valve movement. The control algorithm modulates the I/P converter control signal until the control valve position is according to the input signal.



Technical specifications NDX intelligent valve controller

General

Either loop powered 4-20 mA or Foundation Fieldbus powered, no external power supply required. Suitable for linear and rotary valves. Actuator connections in accordance with VDI/VDE 3845 and IEC 60534-6 standards.

Action:	Single acting or double acting, direct or reverse
Travel range:	Linear (standard): 5-120 mm / 0.2-4.7 in Linear (long range): 120-220 mm / 4.7-8.6 in Rotary: 30-160 degrees

Environmental influence

Standard temperature range:	- 40° – +85 °C / -40° – +185 °F
Influence of temperature on valve position:	Rotary: 0.5 % / 10 °C
Linear:	0.1 mm / 10 °C
LUI usable range:	-25°C ... +65°C
Temperature cycling/Dry heat:	Acc. to IEC 60068-2-2
Humidity Limits:	Acc. to IEC 61514-2
Magnetic Fields:	Negligible at 30 A/m Acc. to IEC 61000-4-8
Vibration:	Tested acc. to ANSI/ISA-75.13.01-2013

Electromagnetic protection

Emission acc. to IEC 61000-6-4
Immunity acc. to EN 61000-6-2

Enclosure

Housing material:	Epoxy coated anodized aluminum alloy, EN1706 AC - AlSi12 (b), copper free, Cu content max 0.4 %
Cover material:	Standard - polycarbonate Explosion Proof - same as housing and glass window
Magnet holder:	Linear, standard: Glass fiber reinforced polyamide, PA66GF20 Linear, long range: Anodized aluminum alloy Rotary: Anodized aluminum alloy
Protection class:	IP66, NEMA 4X IP67 for storage and transport
Pneumatic ports:	
Supply air:	1/4 NPT, G1/4 with additional block
Actuator:	1/4 NPT, G1/4 with additional block
Exhausts:	3/8 NPT, G3/8 with additional block
Cable entry:	2 pcs. 1/2 NPT (M20 with adapter)
Weight:	2.8 kg / 6.2 lbs (Standard) 3.8 kg / 8.4 lbs (Explosion proof) Gauge block 0.9 kg / 2.0 lbs

Pneumatics

Supply pressure:	1.4–8 bar / 20–116 psi (single acting) 2.0–8 bar / 29–116 psi (double acting) Pressure range up to 10 bar with limited life time
Supply media:	Air, nitrogen, sweet natural gas
Effect of supply pressure on valve position:	< 0.1 % at 10 % difference in inlet pressure
Air quality:	Acc. to ISO 8573-1
Solid particles:	Class 7 (40 µm filtration)
Humidity:	Class 1 (at minimum dew point 10 °C/ 18 °F below minimum temperature is required)
Oil class:	3 (or < 1 ppm)
Air capacity[1]:	80 Nm^3 /h / 47.1 scfm
Air consumption in steady state position[1]:	0.1 Nm^3/h / 0.06 scfm

[1] rated at 4 bar / 60 PSI supply pressure
[2] If natural gas is collected from the exhaust, make sure there are no backpressure in the exhaust side. This applies also to so called re-breather application where the exhaust is piped to the actuator spring side.
[3] Natural gas is not allowed with cCSAus certified devices

Electronics (HART)

HART	Protocol versions 7 (default) or 6
Supply power:	Loop powered, 4–20 mA
Min. signal:	3.8 mA
Min. control signal:	3.95 mA
Current max:	120 mA
Load voltage:	9.7 VDC at 20 mA 9.0 VDC at 4 mA
Impedance at 20mA:	485 Ω
Maximum voltage:	30 VDC
Rev. polarity protection:	-30 VDC
Over current protection:	active over 35 mA
Wire size:	0.5-2.5 mm^2 (14-20 AWG)

Position transmitter (optional)

Output signal:	4–20 mA (galvanic isolation; 600 VDC)
Supply voltage:	12–30 VDC
Linearity:	< 0.05 % FS
Temperature effect:	< 0.35 % FS
Failsafe output:	3.5 mA or 22.5 mA
Maximum external load:	690 Ω for I.S.
Ex ia IIC T6	Ui ≤ 28 V

Digital output (optional)

Output signal:	<1.0mA = state '0', >2.2mA = state '1' (NAMUR)
Supply voltage:	5…16VDC

DOs can be used like Namur limit switches or configured to be activated based on any device status.

Electronics (Foundation fieldbus)

Power supply:	Taken from bus
Bus voltage:	9-32 VDC, reverse polarity
Current consumption:	17mA
Max. fault state current consumption:	19mA
Foundation Fieldbus function block execution times:	
AO	10 ms
AI	10 ms
PID	15 ms
DO	10 ms
DI	10 ms
IS	10 ms
OS	10 ms
MAI	10 ms
MDI	10 ms

Performance

Performance with moderate constant load actuators	
Dead band:	≤ 0.2 %
Hysteresis:	< 0.5 %
Linearity error:	< 0.5 %
	Long range: < 1.5 %
Repeatability:	< 0.2 %

Local User Interface (LUI) functions

Accessible with the cover installed.

- PIN code lock to prevent unauthorized / unintended access with the cover installed or permanently (if configured)
- Guided-startup wizard
- Language selection; English, Chinese, Spanish, Italian, French, Korean, German, Turkish, Dutch, Portuguese, Japanese (pending)
- Calibration: Automatic / Manual / 1-Point
- 3-point measurement linearization
- Configuration of the control valve
  - Actuator type & valve type
  - Valve dead angle
  - Safety cut-off range
  - Input signal direction
  - Positioner fail action
- Monitoring of valve position, target position, input signal, temperature, supply and actuator pressure
- Manual control of the valve from Local User Interface

Note: LUI usable temperature range is -25° to +65 °C

Approvals and electrical values

Approval	EC Type examination	Electrical values	Temperature ranges
NDX HART: II 1 G Ex ia IIC T6 ... T4 Ga II 1 D Ex ia IIIC T_{200}85 °C ... T_{200}115 °C Da II 2 G Ex ib IIC T6 ... T4 Gb II 2 D Ex ib IIIC T_{200}85 °C ... T_{200}115 °C Db IP66	EESF 21 ATEX 018X EN IEC 60079-0:2018/ A11:2024 EN 60079-11:2012 IEC 60079-11:2023 Edition 7.0	Input: Ui ≤ 28 V, Ii ≤ 120 mA, Pi ≤ 1 W, Ci ≤ 3.7 nF, Li ≤ 10.9 µH. Output: Ui ≤ 28 V, Ii ≤ 120 mA, Pi ≤ 1 W, Ci ≤ 3.7 nF, Li ≤ 10.9 µH. external load resistance 0–690 Ω NAMUR-DO1, NAMUR-DO2 Ui≤ 16 V, Ii = 25 mA, Pi = 100 mW, Ci = 23.4 nF, Li= 27.8 µH	T4: -40 °C ... +80 °C; T5: -40 °C ... +65 °C; T6: -40 °C ... +50 °C
NDX HART: II 3 G Ex ic IIC T6…T4 Gc II 3 G Ex ec IIC T6…T4 Gc II 3 D Ex ic IIIC T85 °C…T115 °C Dc IP66	EESF 21 ATEX 019X EN IEC 60079-0:2018/ A11:2024 EN 60079-11:2012 IEC 60079-11:2023 EN 60079-7:2015/ A11:2024	Input: Ui ≤ 28 V, Ii ≤ 120 mA, Pi ≤ 1 W, Ci ≤ 3.7 nF, Li ≤ 10.9 µH. Output: Ui ≤ 28 V, Ii ≤ 120 mA, Pi ≤ 1 W, Ci ≤ 3.7 nF, Li ≤ 10.9 µH. external load resistance 0–690 Ω NAMUR-DO1, NAMUR-DO2 Ui≤ 16 V, Ii = 25 mA, Pi = 100 mW, Ci = 23.4 nF, Li= 27.8 µH Input values for type of protection "ec": Ui ≤ 28 V (mA and PT loop) Ui ≤ 16 V (NAMUR-DO1, NAMUR-DO2)	T4: -40 °C ... +85 °C; T5: -40 °C ... +65 °C; T6: -40 °C ... +50 °C
NDX HART: Ex ia IIC T6…T4 Ga Ex ia IIIC T_{200}85 °C…T_{200}115 °C Da Ex ib IIC T6…T4 Gb Ex ib IIIC T_{200}85 °C…T_{200}115 °C Db Ex ic IIC T6…T4 Gc Ex ic IIIC T85 °C…T115 °C Dc Ex ec IIC T6…T4 Gc IP66	IECEx EESF 21.0014X IEC 60079-0:2017 IEC 60079-11:2023 IEC 60079-11:2011 IEC 60079-7:2017	Input: Ui ≤ 28 V, Ii ≤ 120 mA, Pi ≤ 1 W, Ci ≤ 3.7 nF, Li ≤ 10.9 µH. Output: Ui ≤ 28 V, Ii ≤ 120 mA, Pi ≤ 1 W, Ci ≤ 3.7 nF, Li ≤ 10.9 µH. external load resistance 0–690 Ω NAMUR-DO1, NAMUR-DO2 Ui≤ 16 V, Ii = 25 mA, Pi = 100 mW, Ci = 23.4 nF, Li= 27.8 µH	T4: -40 °C ... +80 °C; T5: -40 °C ... +65 °C; T6: -40 °C ... +50 °C
NDX FF: II 1G Ex ia IIC T6…T4 Ga II 1D Ex ia IIIC T_{200} 85 °C…T_{200} 115 °C Da II 2G Ex ib IIC T6…T4 Gb II 2D Ex ib IIIC T_{200} 85 °C…T_{200} 115 °C Db FISCO field device IP66	EESF 24 ATEX 031X EN IEC 60079-0:2018 EN 60079-11:2012 / IEC 60079-11:2023	FISCO ia/ ib: Ui ≤ 24 V, Ii ≤ 380 mA, Pi ≤ 5.32 W, Ci < 5 nF, Li < 10 µH	T4: -40°C ... +80 °C; T5: -40°C ... +65 °C; T6: -40°C ... +50 °C
NDX FF: II 3G Ex ic IIC T6…T4 Gc II 3D Ex ic IIIC T85 °C…T115 °C Dc FISCO field device II 3G Ex ec IIC T6…T4 Gc IP66	EESF 24 ATEX 034X EN IEC 60079-0:2018 EN 60079-11:2012 / IEC 60079-11:2023 IEC 60079-7:2015/ A1:2018	FISCO "ic": Ui ≤ 24 V, Ii ≤ 380 mA, Pi ≤ 5.32 W, Ci < 5 nF, Li < 10 µH Increased safety "ec": UN ≤ 24 V, IN ≤ 23 mA	T4: -40 °C ... +85 °C; T5: -40°C ... +65 °C; T6: -40°C ... +50 °C
NDX FF: Ex ia IIC T6…T4 Ga Ex ia IIIC T_{200} 85 °C…T_{200} 115 °C Da Ex ib IIC T6…T4 Gb Ex ib IIIC T_{200} 85 °C…T_{200} 115 °C Db Ex ic IIC T6…T4 Gc Ex ic IIIC T85 °C…T115 °C Dc FISCO field device or Ex ec IIC T6…T4 Gc IP66	IECEx EESF 24.0040X IEC 60079-0:2017 IEC 60079-11:2023 IEC 60079-7:2017	FISCO ia, ib and ic: Ui ≤ 24 V, Ii ≤ 380 mA, Pi ≤ 5.32 W, Ci < 5 nF, Li < 10 µH Increased safety "ec": UN ≤ 24 V IN ≤ 23 mA	T4: -40 °C ... +85 °C; T5: -40°C ... +65 °C; T6: -40°C ... +50 °C
HDX HART: II 2GD Ex db IIC T6 ... T4 Gb Ex tb IIIC T85 °C ... T113 °C Db IP66	Sira 17ATEX1283X EN 60079-0: 2012 (+A11:2013) EN 60079-1: 2014 EN 60079-31:2014	Input: 4-20 mA, Ui ≤ 30 V Output: 4-20 mA, Ui ≤ 30 V	T4: -40 °C ...+85 °C; T5: ≤+72 °C; T6: ≤+57 °C
NDX HART: Ex db IIC T6 ... T4 Gb Ex tb IIIC T85 °C ... T113 °C Db IP66	IECEx SIR 17.0069X IEC 60079-0 : 2011 IEC 60079-1 : 2014-06 IEC 60079-31 : 2013	Input: 4-20 mA, Ui ≤ 30 V Output: 4-20 mA, Ui ≤ 30 V	T4: -40 °C ...+85 °C; T5: ≤+72 °C; T6: ≤+57 °C

Approval	CSA certificate number	Electrical values	Temperature ranges
NDX HART: Class I, Division 1, Groups A, B,C,D T4/T5/T6 Class II, Division 1, Groups E, F, G T_{200}85°C to T_{200}115°C Class III Division 1 T_{200}85°C to T_{200}115°C Ex ia IIC T4/T5/T6 Ga Ex ia IIIC T_{200}85°C to T_{200}115°C Da Class I, Zone 0, AEx ia IIC T4/T5/T6 Ga Class I, Zone 20, AEx ia IIIC T_{200}85°C to T_{200}115°C Da type 4X IP66	80095494 CAN/CSA C22.2 No. 60079-0:2019 CAN/CSA C22.2 No. 60079-11:2014 CAN/CSA C22.2 No. 60079-7:2016 +AMD1 :2018 UL 60079-0:2019 Ed 7.0 UL 60079-11:2013 Ed 6.0 UL 60079-7:2017 Ed 5.0 CSA C22.2 No. 61010-1-12, UPD1: 2015, UPD2: 2016, AMD1: 2018 UL 61010-1, 3rd Edition (2012) Amd1: 2018 CSA C22.2 No.94.2:20, 3rd Ed UL50E, 3rd Ed (2020)	Input and PT loop: Ui ≤ 28 V, Ii ≤ 120 mA, Pi ≤ 1.0 W, Ci ≤ 3.7 nF, Li ≤ 10.9 µH DO loop: Ui ≤ 16 V, Ii ≤ 25 mA, Pi ≤ 100 mW, Ci ≤ 23.4 nF, Li ≤ 27.8 µH NDX---0 intrinsically safe when installed as per F105207 NDX---1 and NDX---2 intrinsically safe when installed as per F105208	For "ia" or "ib": T6: -40°C … +50°C or T_{200}85°C T5: -40°C … +65°C or T_{200}100°C T4: -40°C … +80°C or T_{200}115°C For "ic" or "ec": T6: -40°C … +50°C or T_{200}85°C T5: -40°C … +65°C or T_{200}100°C T4: -40°C … +85°C or T_{200}115°C
NDX HART: Class I, Division 2, Groups A, B, C, and D; T4/T5/T6 Ex ec IIC T4/T5/T6 Gc Class I, Zone 2 AEx ec IIC T4/T5/T6 Gc type 4X IP66		Input and PT loop: Umax ≤ 28V DO loop: Umax ≤ 16 V	

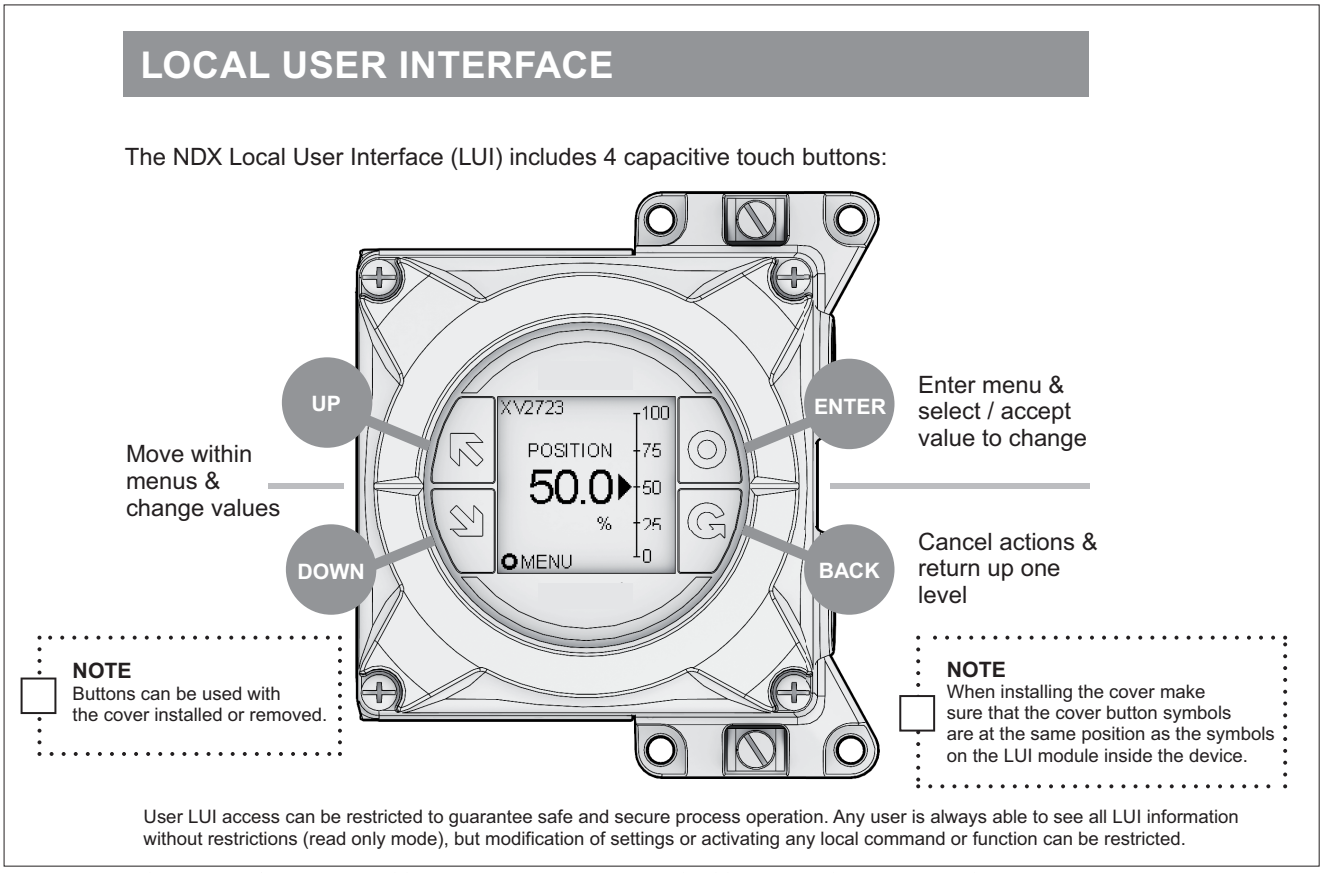


Fig. 1. Local User Interface (LUI) enables easy parameterization and calibration without opening device cover. It also gives real time awareness of control parameters in the device at a glance.

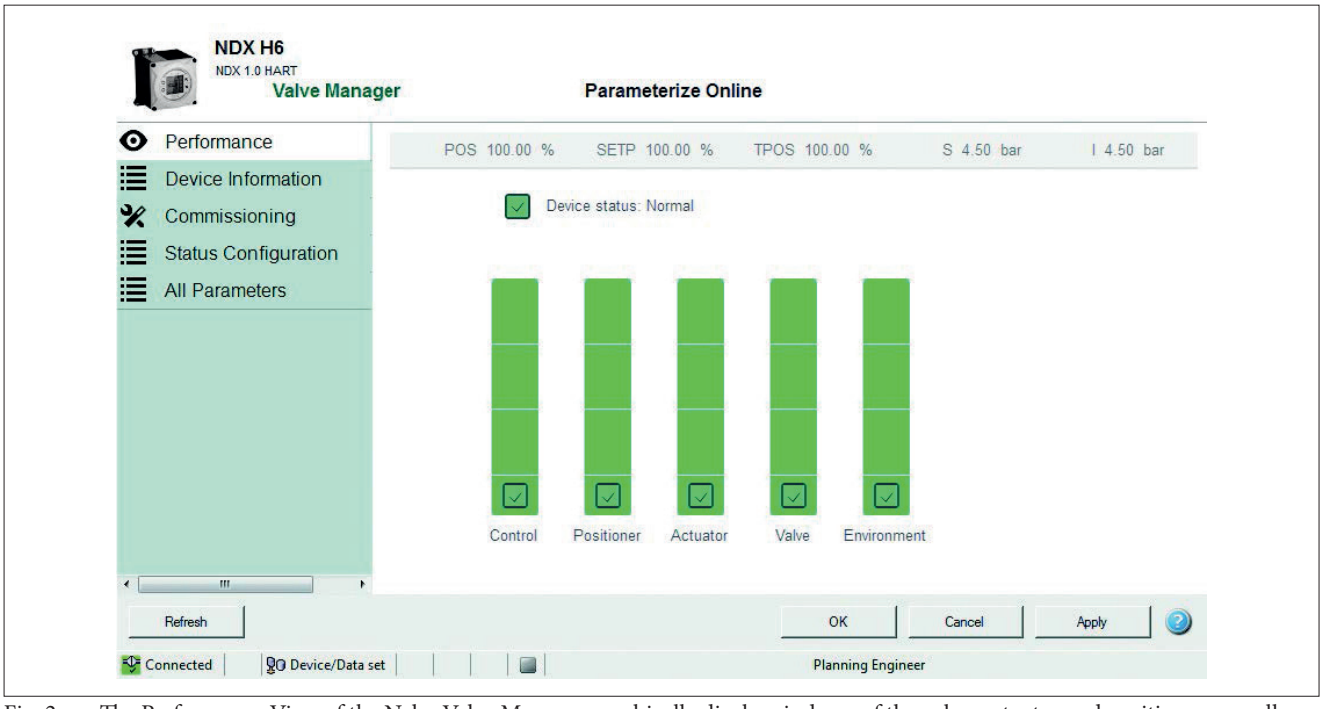
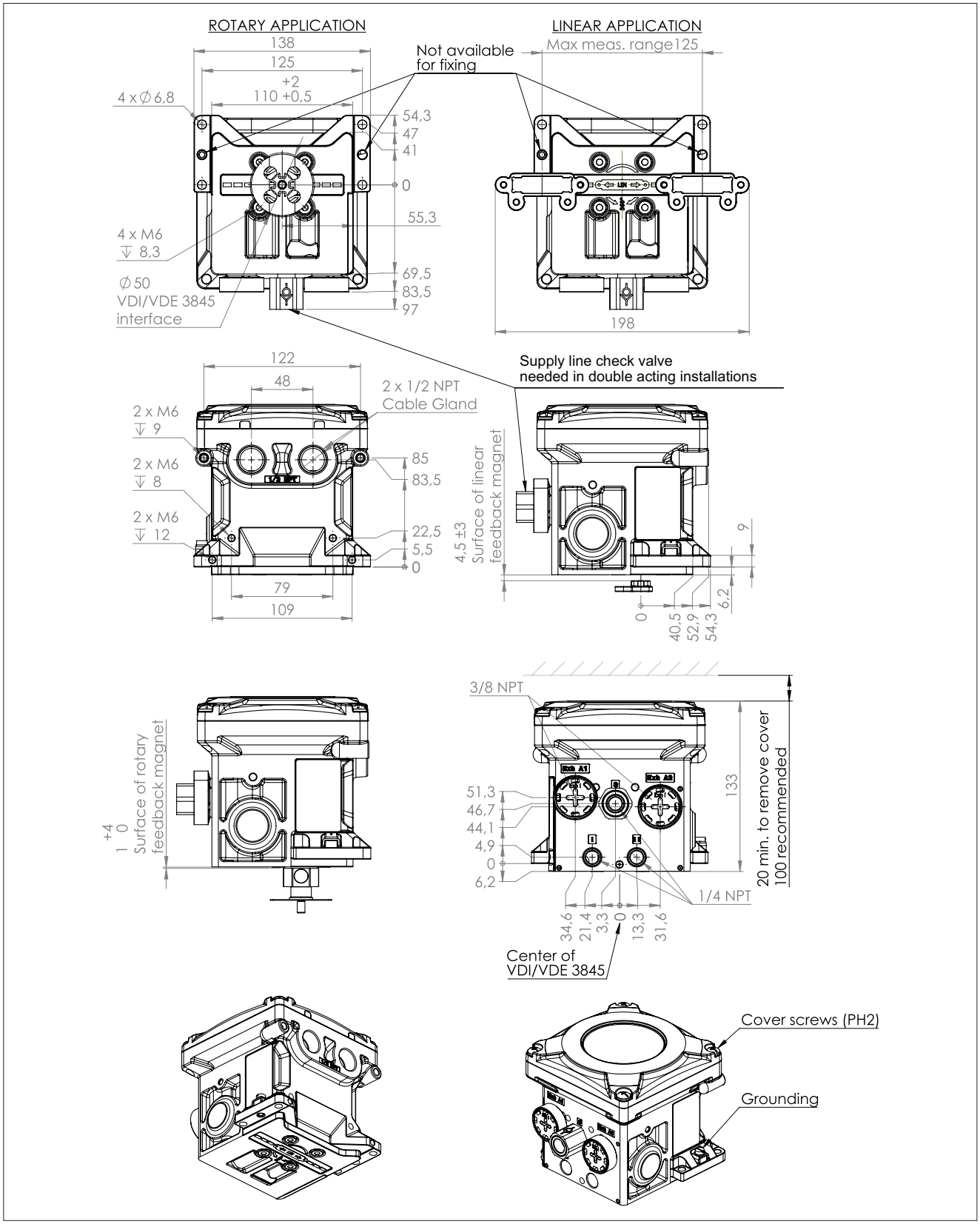


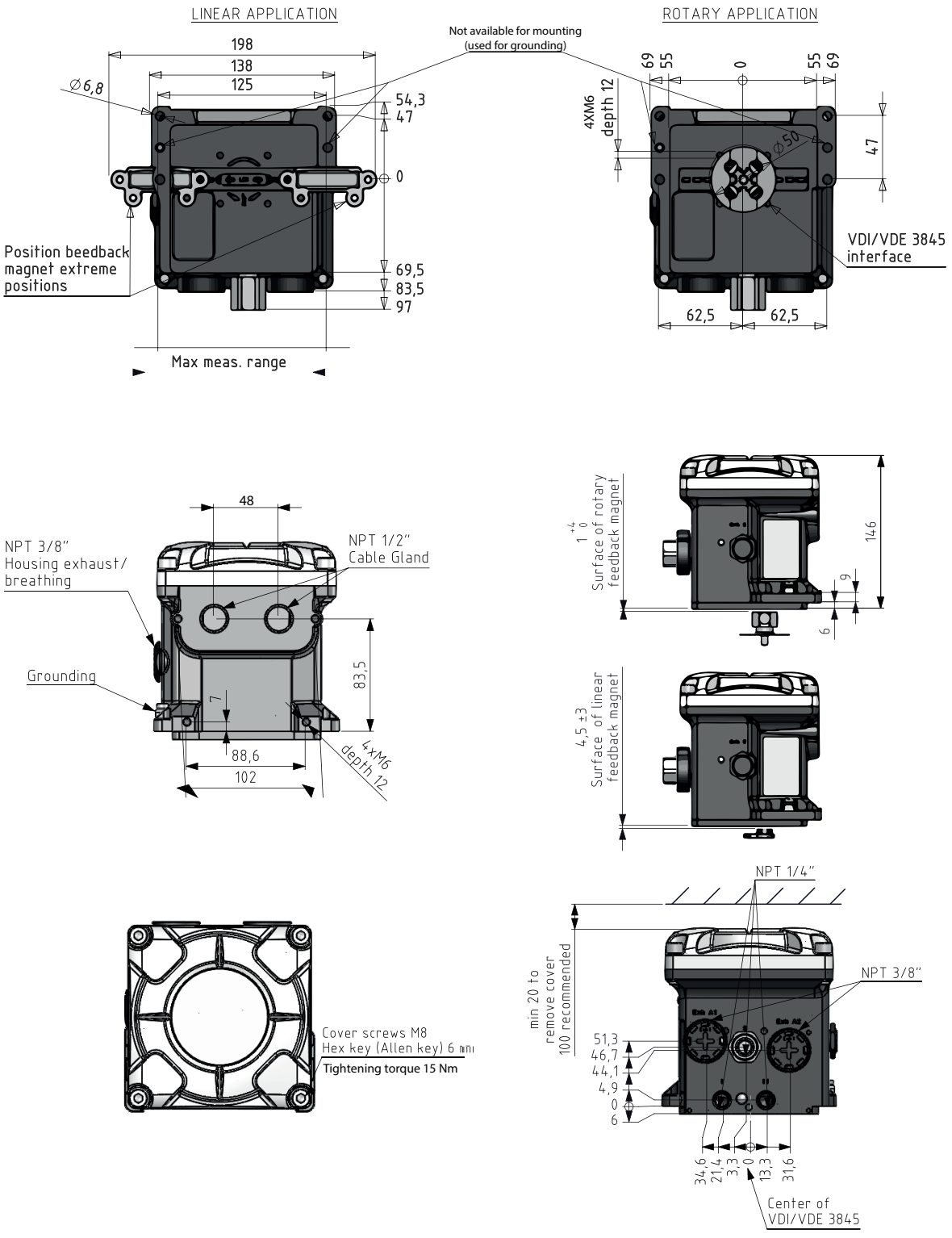
Fig. 2. The Performance View of the Neles Valve Manager graphically displays indexes of the valve, actuator and positioner, as well as indexes of control performance and the application environment. Report will show explanations of the status of each component and guidelines for recommended actions.

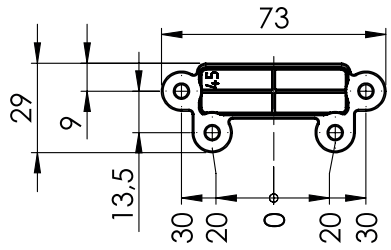
Dimensions

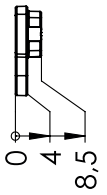
NDX_511_



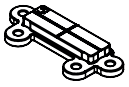
NDX_512_

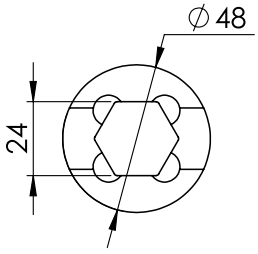

LINEAR APPLICATION
ROTARY APPLICATION
Not available for mounting
(used for grounding)
198
138
125
Ø6,8
54,3
47
0
69,5
83,5
97
Position beedback
magnet extreme
positions
Max meas. range
69
55
0
55
69
4XM6
depth 12
Ø50
47
VDI/VDE 3845
interface
62,5
62,5
48
NPT 3/8"
Housing exhaust/
breathing
NPT 1/2"
Cable Gland
Grounding
83,5
7
88,6
102
4xM6
depth 12
Surface of rotary
feedback magnet
146
9
6
4,5 ±3
Surface of linear
feedback magnet
NPT 1/4"
NPT 3/8"
min 20 to
remove cover
100 recommended
51,3
46,7
44,1
4,9
0
6
34,6
21,4
3,3
0
13,3
31,6
Center of
VDI/VDE 3845
Cover screws M8
Hex key (Allen key) 6 mm
Tightening torque 15 Nm

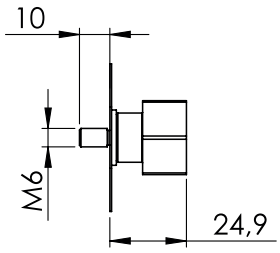




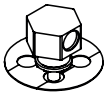
LINEAR

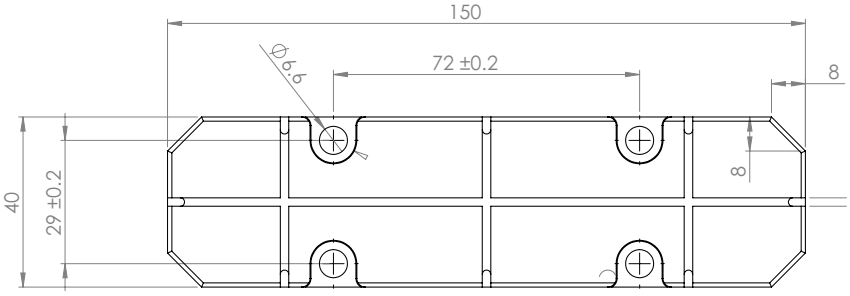




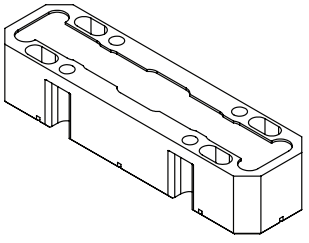


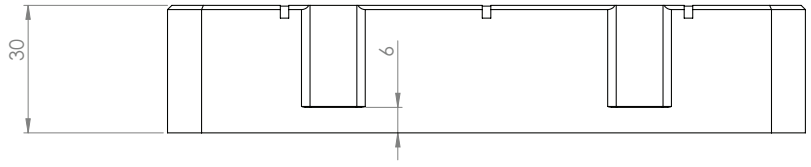
ROTARY



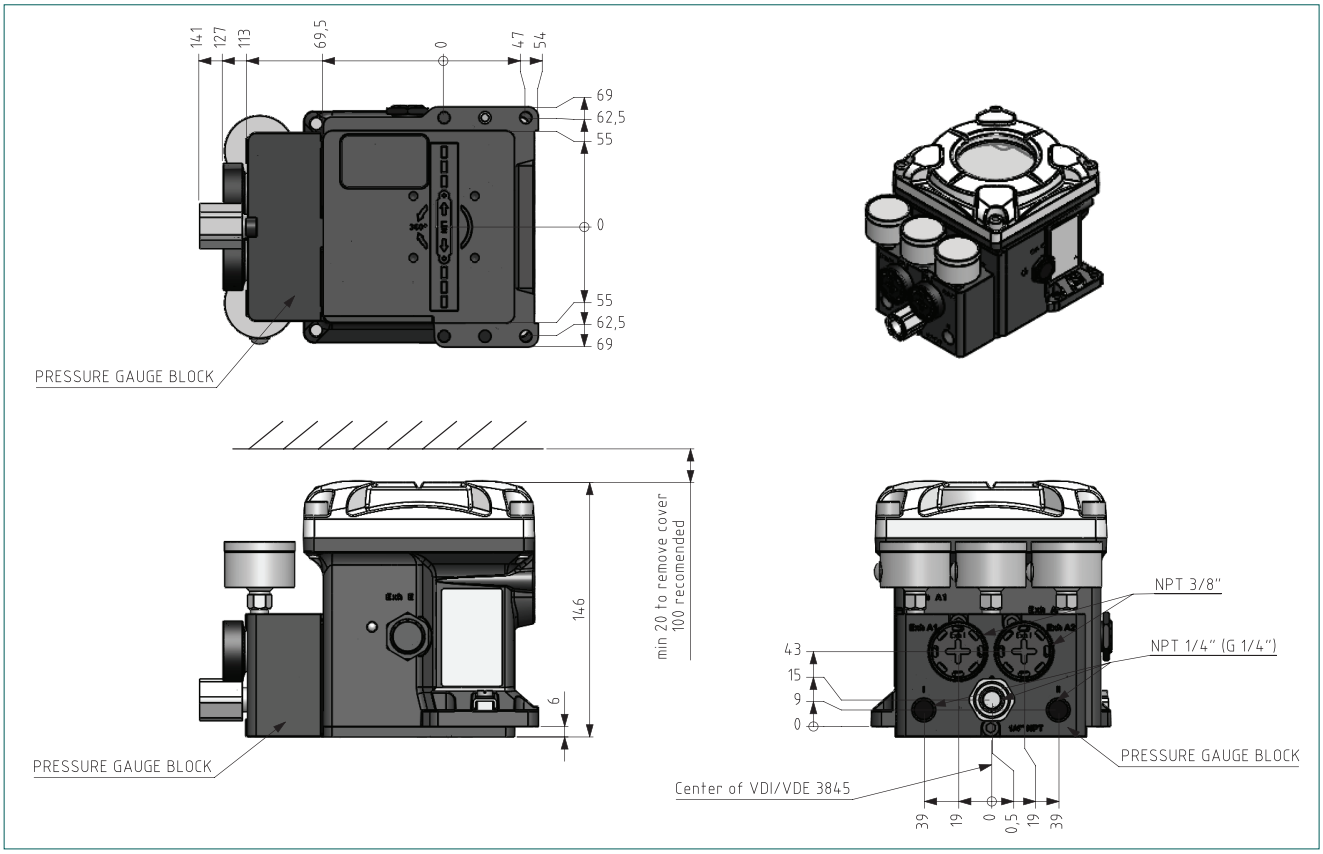


LONG STROKE MAGNET

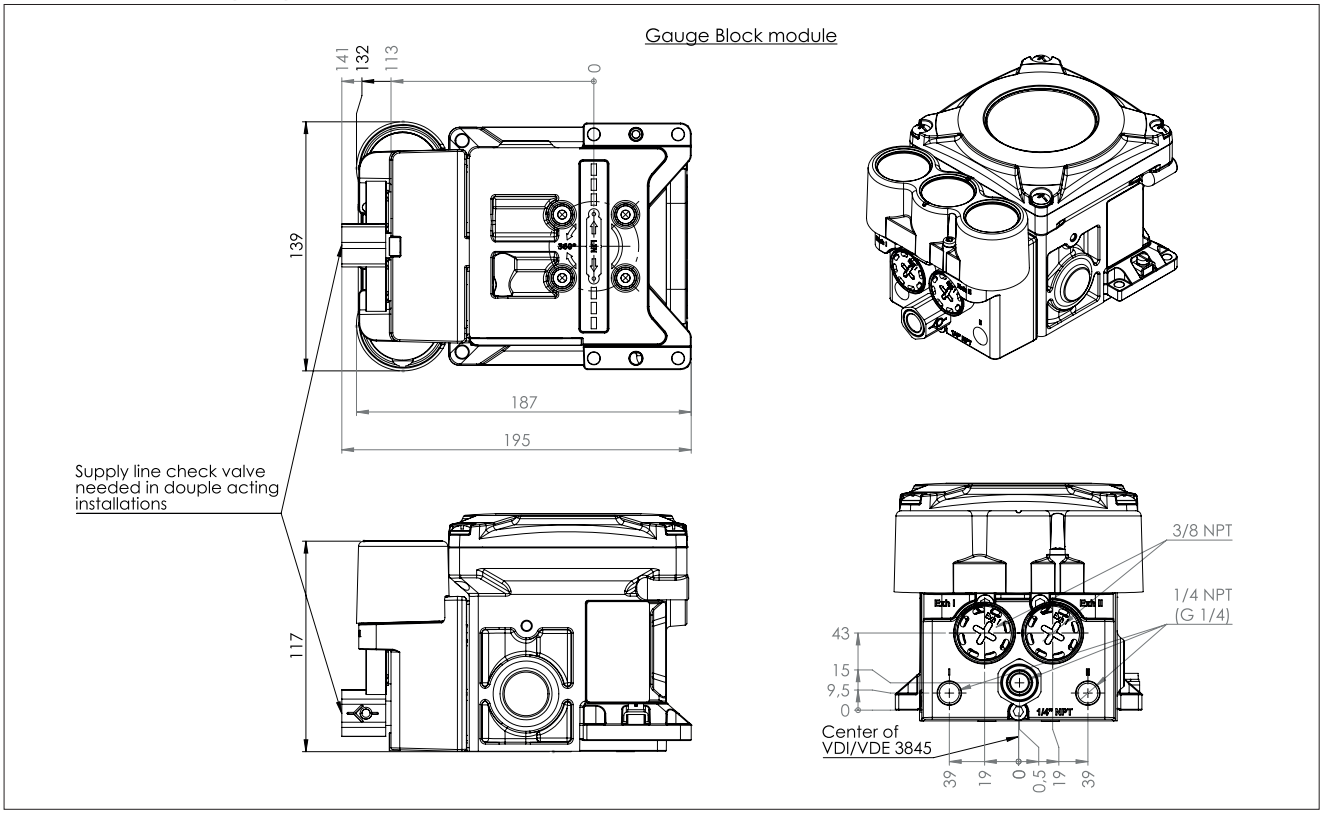




NDX_512_ with gauges



NDX_511_ with gauges



How to order intelligent valve controller NDX standard model

1. sign	**PRODUCT GROUP**
	Intelligent valve controller series NDX standard model
2. sign	**PNEUMATIC ACTION**
1	Single acting
2	Double acting (suitable also for single acting actuators)
3. sign	**PNEUMATIC CAPACITY**
5	Normal capacity (80 Nm³/h)
4. sign	**FAIL ACTION**
1	Fail safe
5. sign	**ENCLOSURE** **IP66 / NEMA 4X. 1/2 NPT conduit entry, 2 pcs**
1	Standard - Epoxy coated anodized aluminum housing with polycarbonate cover
2	Flameproof / Explosion Proof - Epoxy coated anodized aluminum housing and cover
6. sign	**COMMUNICATION / INPUT SIGNAL RANGE**
H	4-20 mA with HART communication
T	4-20 mA with HART + PT Internal 2-wire (passive) position transmitter. Analog position feedback signal, output 4-20 mA, supply voltage 12 - 30 V DC
D	4-20 mA with HART communication + 2 x DO Two digital output (DO) channels, 2-wire type, DC; > 3 mA; < 1 mA, NAMUR NC.
L	4-20 mA with HART communication + PT + DO Internal 2-wire (passive) position transmitter & one digital output (DO) channel. Analog position feedback signal, output 4-20 mA, supply voltage 12 - 30 V DC. DO, 2-wire type, DC; > 3 mA; < 1 mA, NAMUR NC.
F	Foundation Fieldbus, Physical layer according to IEC 61158-2 Applicable to 5. sign “1” and 9. and 10. sign “N” or “X”
7. sign	**TEMPERATURE RANGE**
G	General: -40 ... +85 °C / -40 ... +185 °F
8. sign	**SHALL ALWAYS BE HYPHEN OR SLASH**
	This sign is selected automatically based on the other signs. If the device is Ex approved then it will have “-“for Ex electronics module and if not then “/” for non-Ex electronics module.
-	Electronics module designed for Ex i use
/	Applicable to 5. sign “1” and 9. and 10. sign “N”. Electronics module only for non-Ex applications. Not suitable for I.S. or I/O extension.
9. sign	**APPROVALS FOR HAZARDOUS AREAS 1**
	If approvals are selected for both signs 9. and 10., keep the order shown below, e.g. XE type shall be selected instead of EX type. If there is no need for dual approval, sign 9. or 10. shall be N.
N	No approval
X	ATEX and IECEx certifications: II 1 G Ex ia IIC T6...T4 Ga II 1 D Ex ia IIIC T_{200}85 °C…T_{200}115 °C Da II 2 G Ex ib IIC T6...T4 Gb II 2 D Ex ib IIIC T_{200}85 °C…T_{200}115 °C Db II 3 G Ex ic IIC T6...T4 Gc II 3 G Ex ec IIC T6...T4 Gc II 3 D Ex ic IIIC T85 °C...T115 °C Dc Applicable to all 6. signs. FISCO field device applicable to 6. sign ”F” only.
E	ATEX and IECEx certifications: II 2GD Ex db IIC T4...T6 Gb Ex tb IIIC T85…T113°C Db T4: -40°C to +85°C; T5: -40°C to +72°C; T6: -40°C to +57°C Applicable to 5. sign ”2”

NDX	**2**	**5**	**1**	**1**	**H**	**G**	**-**	**X**	**N**	**0**	**N**	**0**	**0**	**0**	**0**	**-**	**1**	**2**	**8**	**SAMPLE MODEL CODE (char = 21)**
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

								9. sign												**APPROVALS FOR HAZARDOUS AREAS 1**
								U												cCSAus certifications: Class I, Division 1, Groups A, B,C,D T4/T5/T6 Class II, Division 1, Groups E, F, G T_{200}85°C to T_{200}115°C Class III Division 1 T_{200}85°C to T_{200}115°C Ex ia IIC T4/T5/T6 Ga Ex ia IIIC T_{200}85°C to T_{200}115°C Da Class I, Zone 0, AEx ia IIC T4/T5/T6 Ga Class I, Zone 20, AEx ia IIIC T_{200}85°C to T_{200}115°C Da Class I, Division 2, Groups A, B, C, and D; T4/T5/T6, Ex ec IIC T4/T5/T6 Gc Class I, Zone 2 AEx ec IIC T4/T5/T6 Gc
								C												CCC Ex (China) certifications: Ex ia IIC T4...T6 Ga Ex ia IIIC T_{200}85 °C…T_{200}115 °C Da Ex ib IIC T4...T6 Gb Ex ib IIIC T_{200}85 °C…T_{200}115 °C Db Ex ic IIC T4...T6 Gc Ex ic IIIC T_{200}85 °C…T_{200}115 °C Db Ex ec IIC T4...T6 Gc
								D												CCC Ex (China) certifications (Ex d): Ex db IIC T4...T6 Gb Ex tb IIIC T85°C...T113°C Db Applicable to 5. sign "2"
									10. sign											**APPROVALS FOR HAZARDOUS AREAS 2** If approvals are selected for both signs 9. and 10., keep the order shown below, e.g. XE type shall be selected instead of EX type. If there is no need for dual approval, sign 9. or 10. shall be N.
									N											No approval
									X											ATEX and IECEx certifications See 9. sign "X" for details
									E											ATEX and IECEx certifications See 9. sign "E" for details
									U											cCSAus certifications See 9. sign "U" for details
									C											CCC Ex (China) certifications: See 9. sign "C" for details
									D											CCC Ex (China) certifications (Ex d): See 9. sign "D" for details
									J											Japan certifications: Ex d IIC T6...T4 Gb Ex tb IIIC T85°C...T113°C Db T4: -40°C to +85°C; T5: -40°C to +72°C; T6: -40°C to +57°C Applicable to 5. sign "2"
									K											KOSHA (Korea) certifications: Ex d IIC T6...T4 T4: -40°C to +80°C; T5: -40°C to +65°C; T6: -40°C to +50°C Ex tD A21 IP66 T* T113°C: -40°C to +85°C, T95°C: -40°C to +72°C, T85: -40°C to +57°C Applicable to 5. sign "2"
									W											KOSHA (Korea) certifications: Ex ia IIC T6...T4, Ex iaD 20 T85 °C IP66
										11. sign										**PNEUMATIC CONNECTIONS & GAUGES**
										0										Standard, 1/4 NPT, no gauges
										1										1/4 NPT, gauges (block with 1/4 NPT threads + gauges)
										2										G1/4, no gauges (block with G1/4 threads)
										3										G1/4, gauges (block with G1/4 threads + gauges)
											12. sign									**VARIANT**
											N									Neles
												13. sign								**DIAGNOSTICS**
												0								Advanced diagnostics
												1								Premium diagnostics
													14. sign							**RESERVED**
													0							None
														15. sign						**RESERVED**
														0						None
															16. sign					**RESERVED**
															0					None
																17. sign				**SHALL ALWAYS BE HYPHEN**
																	18.-20. sign			**PARTNER CODE*** **Characters 18 - 20 reserved for partner identification**
																	0	7	5	Partner 1
																	1	2	8	Partner 2
																	6	6	8	Partner 3
																				*) If there is no partner code, there will not be sign 17-20
NDX	**2**	**5**	**1**	**1**	**H**	**G**	-	**X**	**N**	**0**	**N**	**0**	**0**	**0**	**0**	-	**0**	**0**	**0**	**SAMPLE MODEL CODE (char = 21)**
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

Additional accessories

CONDUIT ENTRY NIPPLES	
CE10	M20x1,5 conduit entry nipples Brass 1/2NPT / M20x1,5 (H5407)
CE52	M20x1,5 conduit entry nipples AlMgSi1 Anodized 1/2NPT / M20x1,5 (H140515)

CABLE GLANDS	
CG51	1/2NPT for NDX (H142731, grey/plastic)
CG8	1/2NPT for NDX (code H6813, blue/plastic)
CG17	1/2NPT for NDX (For armored cable, inner OD 8-12mm / outer OD 11-16mm), Ex d / Ex e, (H7130, BRASS+ENP)

PRESSURE GAUGES AND CONNECTION BLOCKS

Pressure gauges in modules GB21, GB22, GB24, GB25: scale 0-12 bar/ psi/kPa (bar/psi/ kg/cm²), AISI304 housing, polycarbonate lens, oil filled. Temperature range -55...+85 °C / -67...+185 °F.
Material of pneumatic connection block is AlSiMg, painted grey in blocks GB21, GB22, GB23, GB24, GB25

GB21	Two pressure gauges with connections 1/4 NPT (S, C2). Use with single acting NDX and explosion proof or standard housing (NDX1512_ / NDX1511_). Gauges AISI304, block AlSiMg. H158773
GB22	Three pressure gauges with connections 1/4 NPT (S, C1, C2). Use with double acting NDX and explosion proof or standard housing (NDX2512_ / NDX2511_). Gauges AISI304, block AlSiMg. H158774
GB23	Connection block module without gauges. Converts NDX pneumatic connections to G1/4. Use with both single and double acting NDX and explosion proof or standard housing (NDX1511_ / NDX1512_ / NDX2511_ / NDX2512_). H158775
GB24	Two pressure gauges with connections G1/4 (S, C2). Converts also NDX connections to G1/4. Use with single acting NDX and explosion proof or standard housing (NDX1512_ / NDX1511_). Gauges AISI304, block AlSiMg. H158776
GB25	Three pressure gauges with connections G1/4 (S, C1, C2). Converts also NDX connections to G1/4. Use with double acting NDX and explosion proof or standard housing (NDX2512_ / NDX2511_). Gauges AISI304, block AlSiMg. H158777

DRIVER SETS FOR ACTUATORS

DS51	Feedback set for NDX on linear actuators. Includes the magnet and a carrier for the magnet. For stroke lenghts 5-120 mm. (H137410)
DS52	Feedback set (driver set) for NDX on VDI actuators. Includes the magnet and parts needed for attachment to actuator shaft. (H142751).
DS54	Feedback set (driver set) for NDX on long stroke linear actuators. Includes the rotary-linear adapter (H243234). Requires a separate lever arm, based on the actuator stroke length. Contact Valmet for different options.
DS55	Feedback set for NDX on linear long stroke actuators. Includes the magnet and a carrier for the magnet. For stroke lengths 120-220 mm. (H243231)

MOUNTING SETS for NDX / Linear Neles VD series actuators

Mounting sets between the NDX valve controllers and linear Neles VD series actuators, including bracket and feedback system.

MS51	Neles VD 25, stroke length 20 mm. AISI 316. (H134414)
MS52	Neles VD 29, stroke length 20-40 mm. AISI 316. (H134388)
MS53	Neles VD 37, stroke length 20-50 mm. AISI 316. (H134392)
MS54	Neles VD 48/55_R, stroke length 40-80 mm. AISI 316. (H134368)

3RD PARTY MOUNTING SETS for NDX / Linear actuators

Mounting sets between the NDX valve controllers and 3rd party linear actuators, including bracket and feedback system.

MS61	Mounting set for NDX / linear actuators, attachment face according to IEC 60534-6, stroke length 10-120 mm. AISI316. (H134584)
MS62	Masoneilan 37/38 actuators, sizes 9...15. AISI316. (H138350)
MS63	Masoneilan 87/88 actuators, sizes 6...23. Stroke length 12-64 mm. AISI316. (H134156)
MS64	Fisher 657/667 sizes 30...34, stroke length 19-29 mm. AISI316. (H134202)
MS65	Fisher 657/667 sizes 40...50, stroke length 38-51 mm. AISI316. (H138348)
MS66	Fisher 657/667 sizes 70...87, stroke length 76-102 mm. AISI316. (H138349)

3RD PARTY MOUNTING SETS for NDX / Rotary actuators

Mounting sets between the NDX valve controllers and rotary actuators, including bracket and feedback system.

MS81	Mounting set for rotary actuators with VDI/VDE 3845 attachment face, also Neles B-series actuators B1CU/B1JU 6...11. Attachment dimensions 80X30-20 (VDI1). (H141553)
MS82	Mouting set for rotary actuators with VDI/VDE 3845 attachment face. Attachment dimensions 80X30-30 (VDI 2). (H141561)
MS83	Mounting set for rotary actuators with VDI/VDE 3845 attachment face, also Neles B-series actuators B1CU/ B1JU 12...20. Attachment dimensions 130X30-30 (VDI3). (H141563)
MS84	Mouting set for rotary actuators with VDI/VDE 3845 attachment face. Attachment dimensions 130X30-50 (VDI 4). (H141562)

IMOs for NDX

NDX delivery includes the Quick Guide only. The IMO is available in electronic format via www.valmet.com/ndx. If a printed IMO is required with the delivery, use the following.

IM01	NDX IMO English. 7NDX71_EN. (H137441)
IM02	NDX IMO Chinese. 7NDX71_ZH. (H143226)

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