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maXYmos BL

XY monitor for good/bad evaluation of curves

Typ 5867C

maXYmos BL monitors and evaluates XY curves in which two measured variables must be in a certain relationship to each other.

The quality of an individual production step, an assembly or the entire product can be determined based on the shape of such measurement curves. An early decision on good or bad parts not only means savings in time and costs for downstream processes, but also prevents customer errors, including the resulting damage, service cases and costs for analyses.

Description

In addition to a modern and practical housing design, the monitor impresses with its clear menu navigation and practical functionality. The high-contrast colour touchscreen allows maXYmos BL to be operated quickly and easily and process information to be displayed clearly.

The menus are designed in such a way that only the information required for the respective function is displayed.
maXYmos BL is available in various versions and is scalable in terms of both hardware and software. The device provides the relevant functions with which most standard tasks in the field of XY monitoring can be solved.

Application examples

- Pressing in ball bearings
- Rotating and swivelling seat backrests
- Riveting and caulking of housing parts
- Tactile operations on rotary switches etc

During press-fitting, the typical measurement curves are recorded using force and displacement sensors, while torque and angle of rotation sensors are used for swivelling processes. With maXYmos BL, all measured variables that can be measured with piezoelectric, strain gauges, potentiometers or sensors with ±10V signal output can be recorded, visualised in relation to each other and monitored.

Standard scope*

- Measurement function Y(X), Y(t), Y(X,t) or X(t)
- Evaluation via UNI-BOX, LINE-X, LINE-Y, ENVELOPE, NO-PASS (real-time threshold)*
- 4 evaluation elements per curve
- Up to 8,000 XY value pairs per curve
- Short evaluation time, up to 10 parts/second
- 16 measurement programs
- Ethernet TCP/IP for web UI and data transfer
- EtherNet/IP, EtherCAT, PROFINET for process values and control*
- Dig. IO (24 V) for control and results
- 2 real-time switching signals for X and Y threshold*
- Sensor X: ±10 V, potentiometer, or incremental*
- Sensor Y: Piezo or strain gauge and ±10 V*
- Front panel, table or wall mounting
- Info pages on the diagnosis of the cause of NIO
- Internal part ident generator selectable
- Warning and alarm messages
- Access protection for different user groups
- 5" colour touchscreen

Licensed functions*

- Connections and security (incl. LDAPS / AD)
- Extended evaluations (6 EO, GET-REF, CALC)
- IIoT connectivity via OPC-UA
- Sequencer mode

* Functionality depends on hardware and licences.

5867C_003-704e-02.25

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All the following information applies to $T_{operate}$ = +25 °C, U_{in} = 24 VDC, unless otherwise specified and cable length <30 m.

Measuring channels		
Measuring channels	Quantity	1x channel X 1x channel Y
Cut-off frequency -3dB (digital filters deactivated)	Hz	>2 000
Sampling rate X/Y, max.	Sps	5 000
Resolution per channel	Bit	24
Accuracy class after calibration (25 °C, rH <50 %, without operate jump)	%	0.3
Digital low-pass filter per channel	Hz	in steps 1 … 2 000, or Off

Channel X Potentiometer (X8)		
Potentiometer input		
Supply voltage	VDC	4.16 ±5 %
Short-circuit resistance [1]		Yes
Measuring range	%	0 … 100
Track resistance	kΩ	1 … 5
Wiper current @DC	µA	<±1
Linearity error	% FS	<±0.02
Offset drift	ppm/°C	<±50
Gain drift	ppm/°C	<±50
Input noise, typ, 1 Hz to 2 kHz	ppm rms	40
Connection technology		3-wire
Monitor output potentiometer		
Output voltage @ potentiometer setting 0 %	VDC	0.42 ±5 %
Output voltage @ potentiometer setting 100 %	VDC	4.58 ±5 %
Permissible load	kΩ	>10
Linearity error	% FS	<±0.02
Output noise, typ, 1 Hz to 2 kHz	uVrms	20

Channel X ±10 V voltage input (X8)		
Sensor supply		
Supply voltage, nom. [3]	VDC	24
Supply current, max.	mA	200
Short-circuit resistance [1]		Yes
Measurement input		
Input resistance	kΩ	100
Internal source resistance, max.	Ω	50
Nominal measuring range	V	±10
Measuring range overload	V	±11
Maximum input voltage [2]	V	±20
Linearity error	% FS	<±0,02
Offset drift	ppm/°C	<±30
Gain drift	ppm/°C	<±50
Input noise, typ, 1 Hz to 2 kHz	uVrms	100

Channel Y ±10 V voltage input (X9)		
Sensor supply		
Supply voltage, nom. [3]	VDC	24
Supply current, max.	mA	200
Short-circuit resistance [1]		Yes
Measurement input		
Input resistance	kΩ	100
Internal source resistance, max.	Ω	50
Nominal measuring range	V	±10
Measuring range overload	V	±11
Maximum input voltage [2]	V	±20
Linearity error	% FS	<±0.02
Offset drift	ppm/°C	<±30
Gain drift	ppm/°C	<±50
Input noise, typ, 1 Hz to 2 kHz	uVrms	100

Channel Y Piezo (X7)		
Number of channels		
Measuring range 1	pC	±100 … ±750
Measuring range 2	pC	±750 … ±7 500
Measuring range 3	pC	±7 500 … ±75 000
Measuring range 4	pC	±75 000 … ±750 000
Drift		
25 °C, rF < 50 % (non-condensing)	pC/s	<±0.05
50 °C, rF < 60 % (non-condensing)	pC/s	<±0.2
50 °C, rF < 70 % (non-condensing)	pC/s	<±0.2
Input noise, typ, 1 Hz to 2 kHz		
Measuring range 750 pC	pCrms	0.1
Measuring range 7 500 pC	pCrms	0.16
Measuring range 75 000 pC	pCrms	10
Measuring range 750 000 pC	pCrms	16
Reset-Operate jump	pC	<±2
Gain drift	ppm/°C	<±100
Linearity error		
Measuring range 750 pC	%FS	<±0.02
Measuring range 7 500 pC	%FS	<±0.02
Measuring range 75 000 pC	%FS	<±0.02
Measuring range 750 000 pC	%FS	<±0.02
Switchover times Reset → Operate Operate → Reset (drop to <0.3 %)	ms	 <2.5 <2.5

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Channel Y Strain gauge (X6)		
Supply, unloaded	VDC	5 ±5 %
Supply at 200 Ω load	VDC	4.9 ±5 %
Short-circuit resistant [1]		Yes
Permissible bridge resistance	Ω	200 … 1 000
Measuring range	mV / V	–5 … 5
Linearity error	%FS	<±0.1
Input noise, typ, 1 Hz to 2 kHz	mV/V rms	0.005
Connection technology		4-wire / 6-wire

Incremental (X12)		
Sensor supply 24 V		
Voltage nom. [3]	VDC	24
Maximum current	mA	450
Short-circuit resistance [1]		Yes
Sensor supply 5 V		
Tension	VDC	5 ±5 %
Maximum current	mA	300
Short-circuit resistance [1]		Yes
Incremental encoder input		
Interfaces	- ABZ signal, symmetrical (RS-422) - ABZ signal, asymmetrical, 5V level - ABZ signal, asymmetrical, open collector (1k pull-up)	
Internal digital resolution	Bit	32
Max. Input frequency [4]	MHz	
ABZ signal, sym. (RS-422)		10
ABZ signal, asym., 5 V		5
ABZ signal, asym., open collector		0.8

Cycle control	
START-STOP	Dig. in / Threshold X / Threshold Y / Fieldbus / Touchscreen

Measuring functions		
START-STOPP		Y(X), Y(t), Y(X, t), X(t)
Curve memory	XY pairs	Max. 8 000
Historical curves (for NIO diagnosis)		The last 320

Evaluation elements (EOs)		
EO types		UNI-BOX / LINE-X / LINE-Y / ENVELOPE / NO-PASS
Reference points in X direction		Absolute, Block, Trigger-Y
Editing		Numerical input, drawing
Evaluation time	ms	<50 (with 4 EOs)

Measuring programmes		
Quantity		16
Switching via		Menu / Dig.-In / Feldbus
Switching time	ms	<5
Switching thresholds (real time)		
Quantity	2 (S1 and S2)	
Channel assignment	X or Y (selectable)	
Switching time	Threshold X reached, threshold Y reached	
Output	Dig. out or fieldbus	
Mode	Free-running or latch	
Influence on valuation	No (special case "NO-PASS")	

Device status LED		
D1 Device status	Orange	Start up
	Green	Ready for operation
	Red	Error

Digital inputs and outputs (X2)		
Digital inputs		
Quantity		11
Standard		DIN EN61131-2
Input voltage level state "0"	V	–3 … 5
Input voltage level state "1"	V	15 … 30
Input current, Uin = 30 V	mA	<5
Input current, Uin = 5 V	mA	<0.8
Response time, internally	us	<100
Digital outputs		
Quantity		11
Type		High-side switch
Output voltage, nom [3]	VDC	24
Output voltage, typ., state «0», @ RL = 220 Ω	mVDC	1
Output voltage, typ., state «1», @ RL = 220 Ω	VDC	23.5
Output current per output	mA	100
Total output current	mA	400
Short-circuit resistant [1]		Yes
Response time	us	<100
Sensor supply		
Supply voltage, nom. [3]	VDC	24
Supply current, max.	mA	400
Short-circuit resistance [1]		Yes

Real-time reactions		
Switching thresholds S1/S2	ms	<1
EO type "NO-PASS"	ms	<1

Data export	
Format	csv
Target	Server
Transmission via	Ethernet

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Ethernet interface (X3)		
Data rate	MBit	1000

Fieldbus (X10, X11)	
Protocols	EtherCAT, PROFINET, Ethernet/IP

USB interface (X13)		
Interface	USB 2.0 Full Speed, Type A	
Supply voltage	VDC	5 ±5 %
Output current max.	mA	500

Power supply (X1)		
Supply voltage	VDC	18 … 30 (typ. 24)
Power consumption typ. (24 VDC, without peripherals) 5867Cx0x, 5867Cx1x (with display) 5867Cx2x (without display)		 5.5 3.8
Galvanic isolation		Functional separation

Feldbus Status LEDs[4)]		
PROFINET	D2/SF	Red: System error
	D3/BF	Red: Bus error
EtherCAT	D2/RUN	Green: Run
	D3/ERR	Red: Error
EtherNet/IP	D2/MS	Network status
	D3/NS	Netzwerk Status

General technical data		
Protection class (IEC 60529) ...front panel mounting ...desktop housing	IP	 60 20
Operating temperature range	°C	0 … 50
Service temperature range	°C	0 … 50
Storage temperature range	°C	–10 … 60
Rel. humidity (non-condensing))	%	10 … 90
Dimensions		See drawings
Weight …5867Cx0x …5867Cx1x …5867Cx2x	g	 800 850 850

EMV	
Standards	EN 61326-1 :2013 (Product standard - Equipment for measurement and control technology, laboratory, class A, industry)

Legend

[1)] Short-circuit resistance means: No damage in the event of a permanent short circuit; short circuit always against reference potential; reboot of device is permitted

[2)] Higher input voltages can destroy electronics.

[3)] Output voltage is supply voltage minus small internal voltage losses (up to 2 V).

[4)] For cable lengths <5 m. The maximum input frequency decreases with longer cable lengths.

[5)] Basically according to the standards of the fieldbus protocols.

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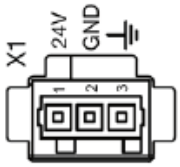
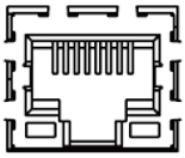
Connections

The actual connections available depend on the design of the appliance. The "Application" chapter contains further information on the correct use of the connections.

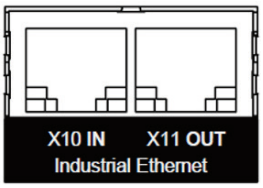
X1 Power supply

Pinout	Function	Pin
	24 VDC	1
	GND	2
	Shield (housing)	3

X3 Ethernet

Pinout	Function	Pin
	RX +	1
	RX –	2
	TX +	3
	-	4
	-	5
	TX –	6
	-	7
	-	8

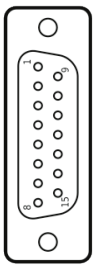
X10/X11 Industrial Ethernet

Pinout	Function (per plug)	Pin
	RX +	1
	RX –	2
	TX +	3
	-	4
	-	5
	TX –	6
	-	7
	-	8

X13 USB type A

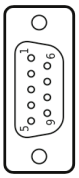
Pinout	Function	Pin
USB A 	5 V	1
	D–	2
	D+	3
	GND	4

X8 Channel X

Pinout	Function	Pin
	24 V sensor supply	1
	nc	2
	Monitor output potentiometer	3
	Input ±10 V signal	4
	Power supply potentiometer –	5
	Power supply potentiometer +	6
	nc	7
	Potentiometer tap input	8
	GND (sensor supply)	9
	nc	10
	GNDX	11
	nc	12
	nc	13
	GNDX	14
	nc	15

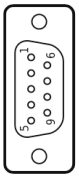
Note: nc = not connected

X6 Channel Y (DMS)

Pinout	Function	Pin
	Supply +	1
	Signal +	2
	Sense cable –	3
	GNDY	4
	nc	5
	Sense cable +	6
	Signal –	7
	Supply –	8
	nc	9

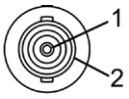
Note: nc = not connected

X9 Channel Y (±10V voltage)

Pinout	Function	Pin
	nc	1
	Input ±10 V signal	2
	GND (sensor supply)	3
	nc	4
	24V sensor supply	5
	nc	6
	GNDY	7
	nc	8
	nc	9

Note: nc = not connected

X7 Channel Y (Piezo)

Pinout	Function	Pin
	Charge input	1
	GNDY	2

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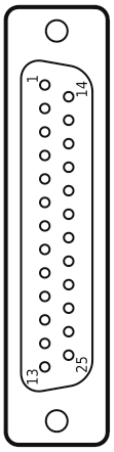
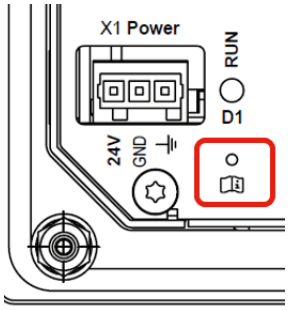
X2 Digital I/O

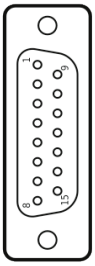
Pinout	Function	Pin
	DO 1	1
	DO 2	2
	DO 3	3
	DO 4	4
	DO 5	5
	DO 6	6
	DO 7	7
	DO 8	8
	DO 9	9
	DO 10	10
	DO 11	11
	24 V sensor supply	12
	GND DO / sensor supply	13
	DI 1	14
	DI 2	15
	DI 3	16
	DI 4	17
	DI 5	18
	DI 6	19
	DI 7	20
	DI 8	21
	DI 9	22
	DI 10	23
	DI 11	24
	GND DI	25

Factory reset button

Pressing the factory reset button for more than 10 seconds resets the device to the factory settings.



X12 Incremental

Pinout	Function	ABZ Sym	ABZ Asym	Pin
	24 V sensor supply			1
	5 V sensor supply			2
	GNDY Signal Torque Internally connected to X9 pin 7			3
	Input ±10 V Torque Internally connected to X9 pin 2			4
	Track A / clock signal +	A+	A	5
	Track B / Data Signal +	B+	B	6
	nc			7
	Z gauge signal +	Z+	Z	8
	GND			9
	GND			10
	GNDY Signal Torque Internally connected to X9 pin 7			11
	Track A / clock signal –	A–		12
	Track B / Data Signal –	B–		13
	GND signal track			14
	Z gauge signal –	Z–		15

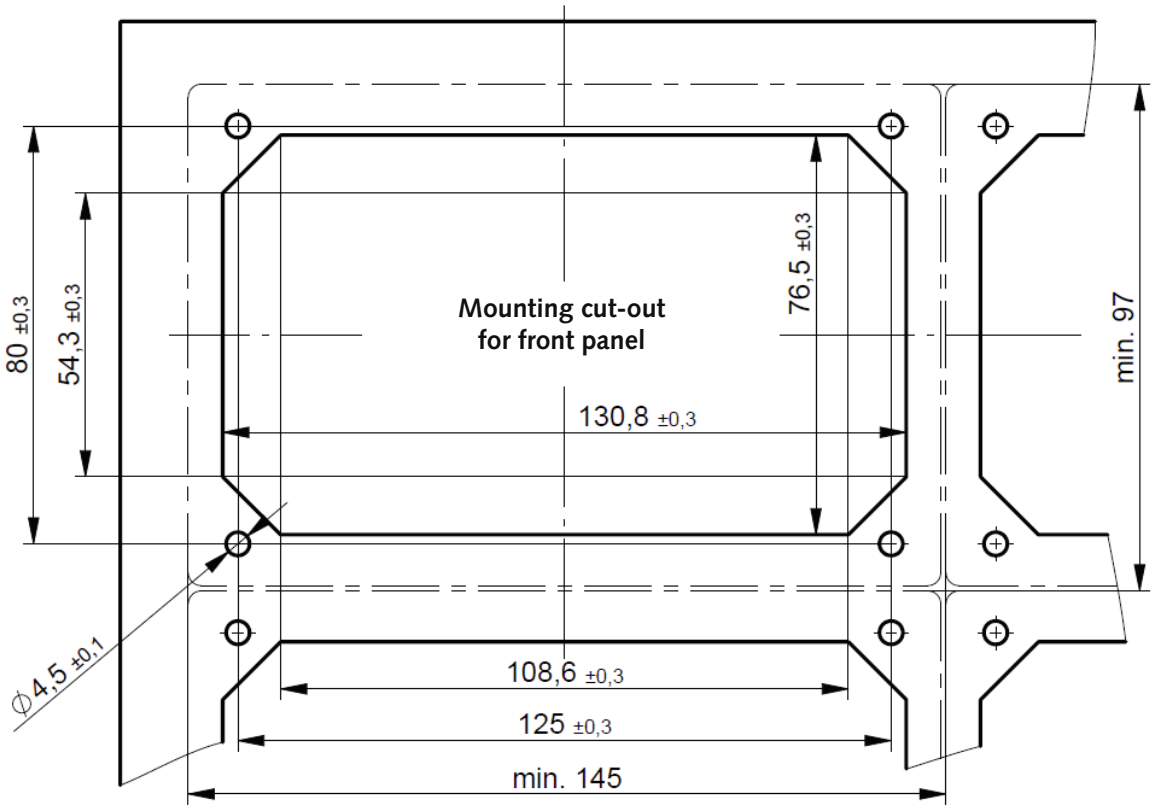
Note: nc = not connected

Note: To connect the torque sensor 4502A to X12, please use the cable 18027071. To connect the torque sensor 4503B to X12, please use the cable 18026961.

5867C_003-704e-02.25

Installation

Mounting cut-out for front panel mounting:



Dimensions

Illustration shows 5867C001:

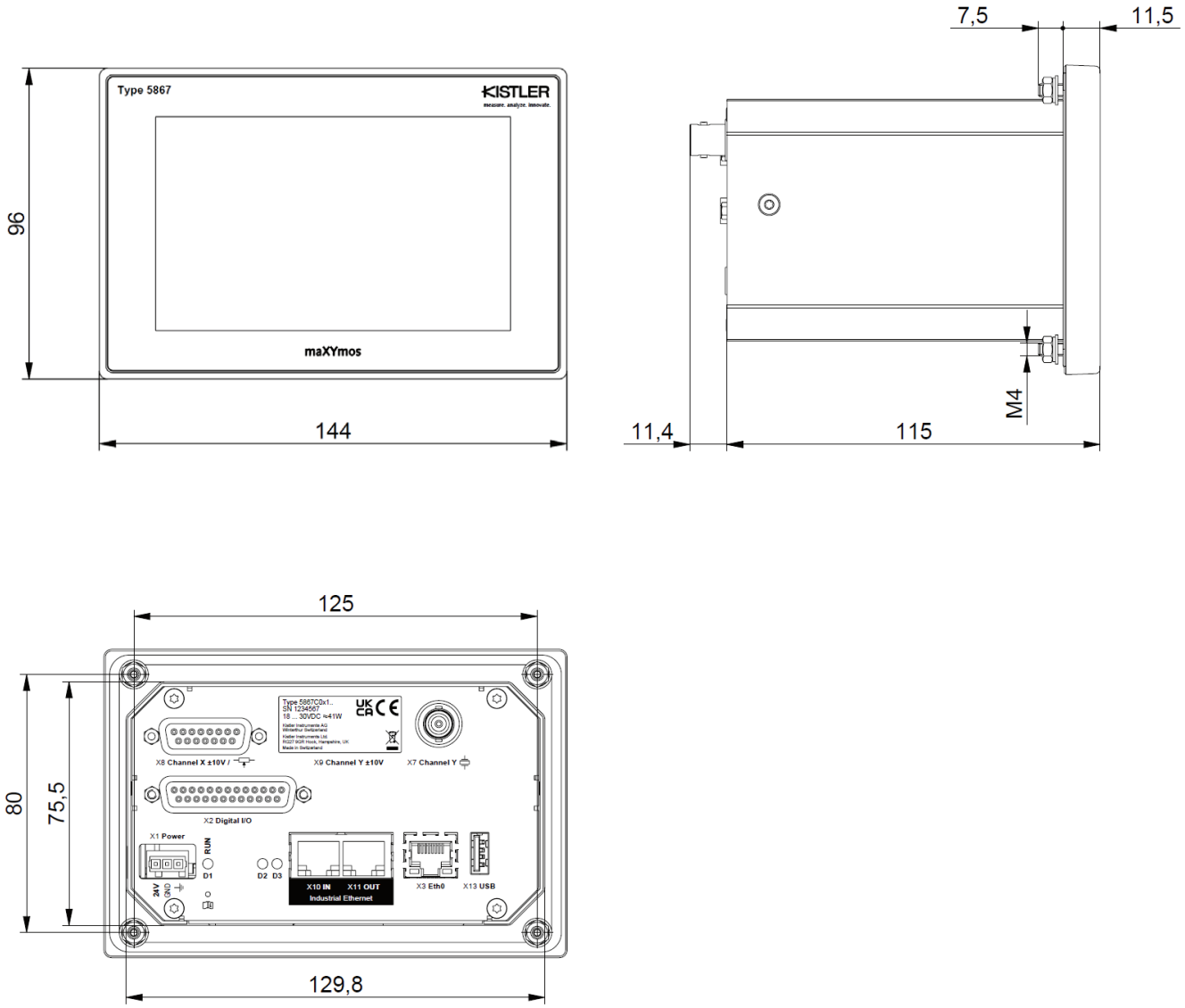
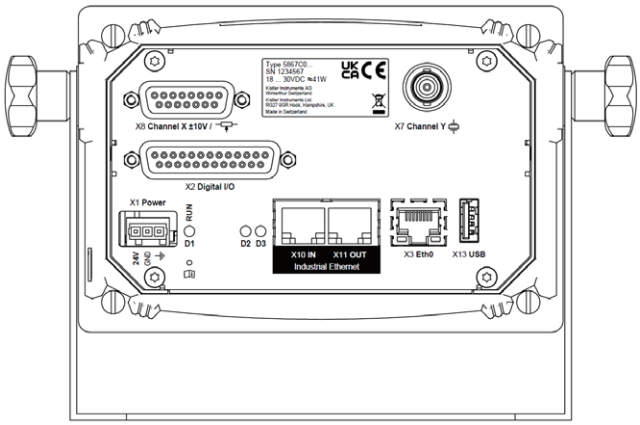
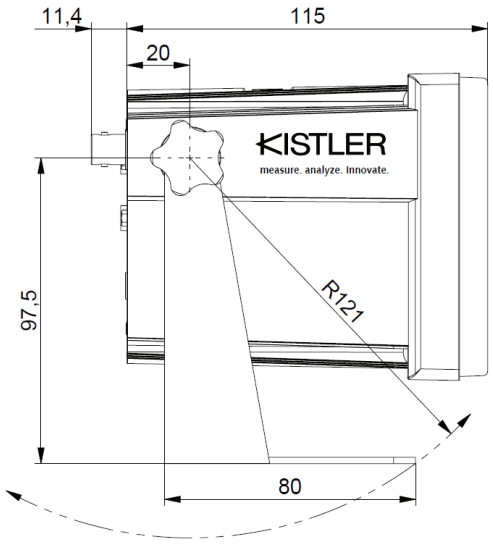
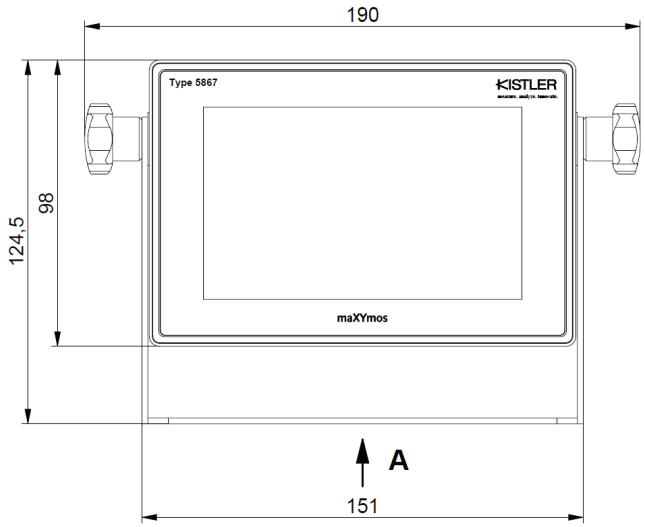


Illustration shows 5867C011:







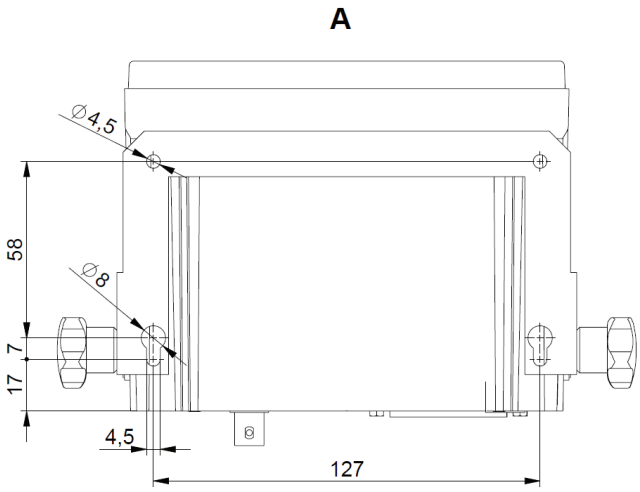
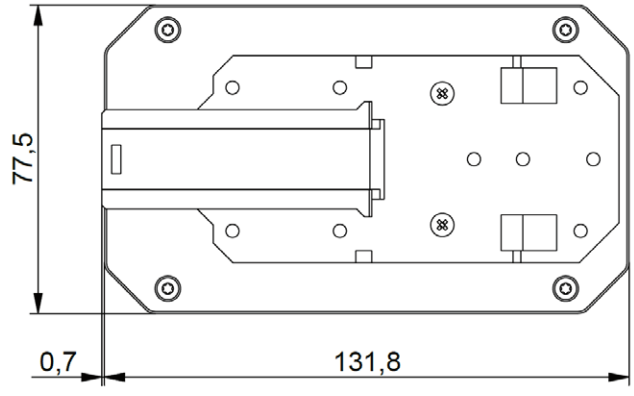
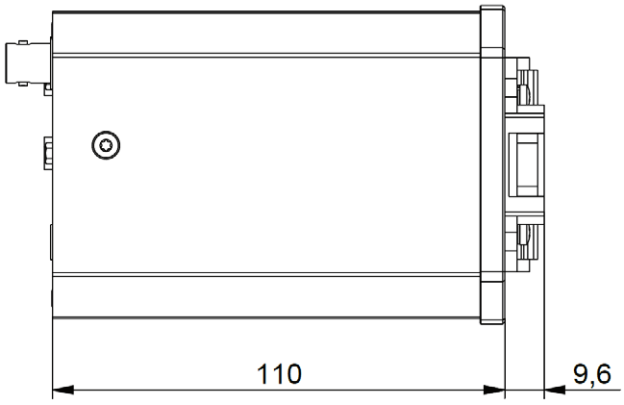


Illustration shows 5867C02x:

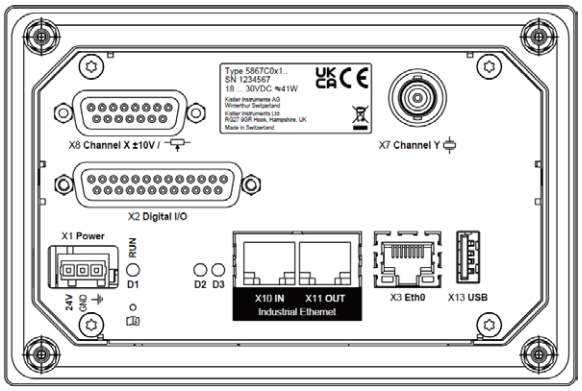




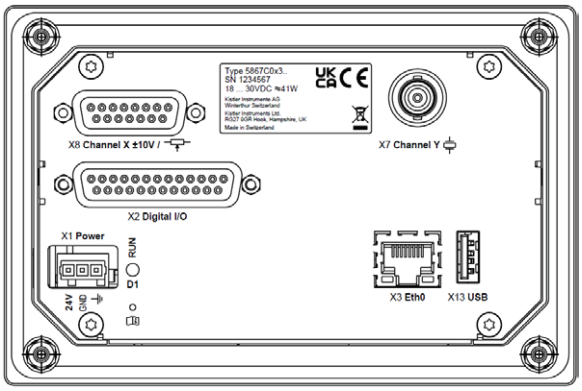
5867C_003-704e-02.25

Connections

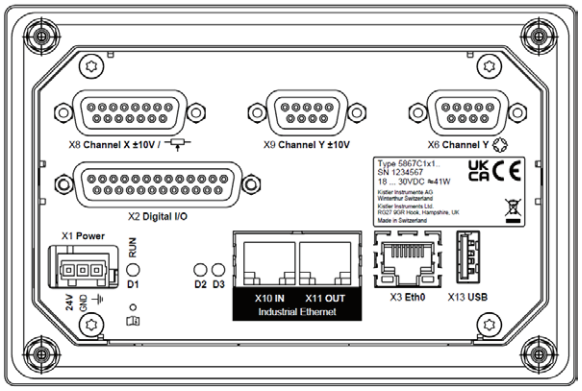
5867C0x1



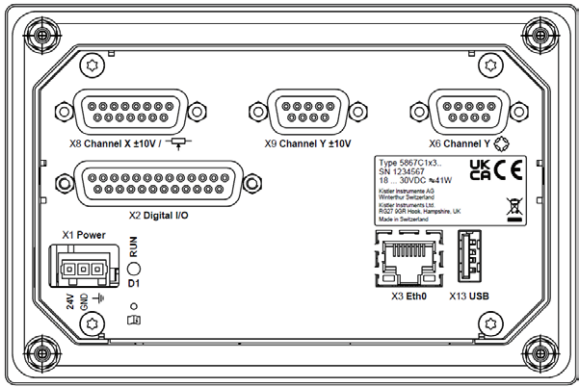
5867C0x3



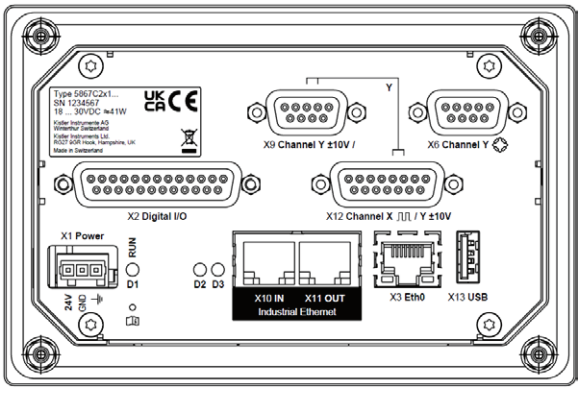
5867C1x1



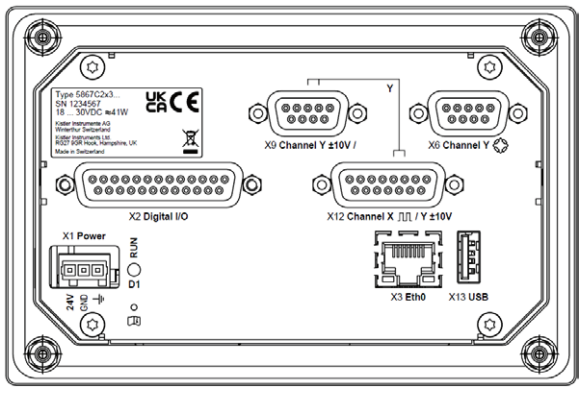
5867C1x3



5867C2x1



5867C2x3



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Order code

Type 5867C ☐☐☐☐☐☐

X/Y channel

Y piezo / X potentiometer	0
Y strain gauge / X potentiometer	1
Y DMS / X incremental	2

Assembly

Front panel mounting	0
Table-wall-mounting	1
DIN rail	2

Network interface

Ethernet/IP, EtherCAT, PROFINET	1
Ethernet only	3

Hardware/software

Device with software	H
Software package only	S

Software licences

Standard	0000
Connections and Security	1xxx
Extended Evaluation	x1xx
IIoT Connectivity	xx1x
Sequencer	xxx1

Accessories supplied	**Type**
• Plug set, strain gauge version, complete for sensors, dig.IO and power supply	5867AZ010
• Plug set, piezo version, complete for sensors, dig.IO and power supply	5867AZ011

Accessories (optional)	**Type**
• Desktop/wall-mounted housing	5867AZ000
• Power supply unit 90 - 264 VAC / 24 VDC ready for connection max. 90 W (3.75 A), country cable configurable	5781B5
• Adapter cable for routing a potentiometric displacement or angle signal to several maXYmos	1200B156AX X= Number of devices; max. 8
• Ethernet cable RJ45 5.0m crossed	1200A49
• Ethernet cable RJ45 0.5m crossed blue	1200A49A3

License	Content	Note	BL
Connections and Security	User Groups	Individual user groups with configurable access rights	○
	User and Password options	Password reuse prevention, lock user, password expiration	
	LDAP user management	Centralized user access management with LDAP/LDAPS/AD	
Extended Evaluation	6 EOs	Allows two more EOs (+2) in each Measurement Program	○
	EO Calc	EO Calc allows simple mathematical Operation (+, -, *, /) with two operands, including UVT table access	
	EO Get-Ref	EO Get-Ref covers more options to get reference values for evaluation or Calc	
	EO Envelope extensions	Adds extended functions, trend tracking warning, catch zone Y	
	Re-Entry ignore (for all EO)	If active, an EO will become inactive after the first contact with the signal (ok or nok)	
IIoT Connectivity	OPC-UA Server	OPC-UA Data Access for Setup Parameters and OPC-UA Events for cyclic reports	○
Sequencer	Sequencer Mode	General sequencer for internal state machine / soft PLC	○
	Part-ID from Barcode/USB	Barcode reader may write ID when connected via USB	

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Block diagram

Complete device