

# Measurement and control unit

## Control of testing and measured data acquisition

Type 5413-2777/XE...

The measurement and control unit handles the monitoring, analysis and control of measurement profiles and testing in the area of fastening technology.

- Records analog and incremental measurands
- Monitors measurement profiles
- Controls drive units in conjunction with a control unit with servo regulator



### Description

The measurement and control unit is a highly integrated, precise and modular measurement control unit used to acquire a broad range of measurands. It captures all the measurement values and handles downstream processing as well as control tasks. The measurement and control tasks are performed in real time, and the testXpert software generates graphic displays of the measurement profiles in near-real time. Once the test has begun, the measurement and control unit handles all the measurement and control tasks autonomously. The PC system with the measurement and evaluation software is used for evaluation, archiving and visualization of the test.

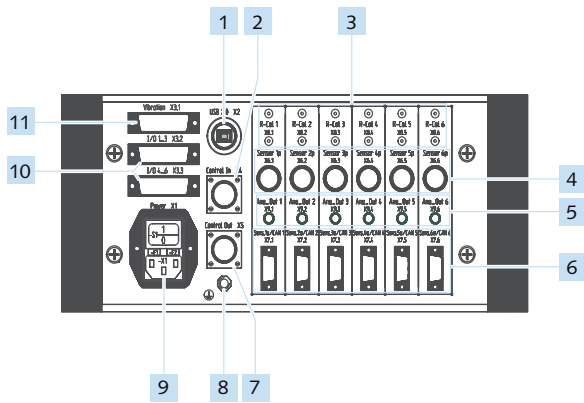
### Application

The measurement and control unit is used to test bolted joints with Kistler analysis systems.

## Technical data

Type	413-2777/XE...	
Measuring channels depending on configuration	Channel 1...6	Passive, analog (0.4 ... 5 mV/V, Power supply 5 V/10 V short-circuit proof, line-compensated)
	optional	Active, analog (1 ... 10 V, power supply $\pm$ 12 V, max. 3 W, short-circuit proof)
	Channel 1...6	Incremental (quadrature signal 5 ... 24 V, max. counting frequency 40 kHz, switching level 2.5 V)
Integrated calib. resistance	40 k $\Omega$ , 58.159 k $\Omega$ , 87.15 k $\Omega$ , 218.4 k $\Omega$	
Achievable meas. uncertainty	$\leq$ 0.5%	
Resolution	16-bit	
Automatic offset compensation	$\pm$ 10%	
Control reserve (overload capacity)	20%	
Anti-aliasing filter	5-pin low-pass with Bessel characteristics, adjustment range: 1 Hz ... 10 kHz	
Adjustment range for sampling frequency	1 Hz ... 20 kHz	
Sensor indication	Passive sensors: presence via sensor cable (compensation lead) Optional AUTOCODE for appropriately equipped sensors Active sensors: type selection and presences via adapter cable with AUTOCODE	
Nominal voltage	100 ... 240 V, integrated overvoltage protection (class T3)	
Nominal frequency	50 Hz/60 Hz	
Connected load	< 100 VA	
Communication interface to PC	USB 2.0 (BUS-powered)	
Interfaces	Optional / Channel 1, 2, 3, 5, 6	4 inputs and 3 outputs, electrically isolated (Inputs: permitted input voltage max. + 30 V, switching threshold + 3.9 V, Outputs: permitted voltage max. 42 V AC, 60 V DC, max. switched current 0.1 A)
Plug-in connection sockets	Sensors	ODU flange socket, 16-pin, Type G52LOC-P16NFGO - meas. channel 1...6 passive analog and incremental ODU flange socket, 19-pin, Type G52LCC-P19NFDO - meas. channel 2/3 2x passive analog for F/T <sub>th</sub> sensor D-Sub DE-15S - meas. channel 1...6 active analog and incremental
	Control output	Tuchel Type C091 12-pin sockets for control of drive units in conjunction with a control unit with servo regulator
	Control input	Tuchel Type C091 7-pin sockets for control elements Optional I/O D-Sub DE-255 Slots for external calibration resistors
Dimensions (L x W x H)	340 mm x 420 mm x 170 mm	
Weight	Approx. 5.2 kg (depending on module quantity and options)	
Operating temperature range (Nominal temperature range)	10 ... 40 °C	
Service temperature range	0 ... 50 °C	
Storage temperature range	-20 ... 70 °C	
Air humidity	max. 70%, non-condensing	
Degree of protection	IP 20	
Protection class	I (protective grounding)	

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- 1 USB 2.0 - PC
- 2 Control input for control box
- 3 Connections for external calibration resistors
- 4 Measuring channel 1...6 passive, analog and incremental depending on configuration
- 5 Currently not used
- 6 Measuring channel 1...6 active, analog and incremental depending on configuration
- 7 Control output to control unit with servo regulator
- 8 Connection point for equipotential bonding
- 9 Connection to power supply and mains switch with fuse
- 10 Control inputs and outputs (optional)
- 11 Control input and output for vibration test bench (optional)

Connections of measurement and control unit 5413-2777/XE..

### Pin assignments

#### ODU flange socket, 16-pin

+ Power supply	+ E	1
+ Compensation	+ C	2
+ Signal voltage	+ S	3
- Signal voltage	- S	4
- Compensation	- C	5
- Power supply	- E	6
Shunt calibration	CAL	7
+ 5V	VCC	8
Sine signal	SIN	9
Cosine signal	COS	10
GND	GND	11
Autocode	DS	12
GND	GND	13
Reserved		14
Reserved		15
Reserved		16

#### D-Sub DE flange socket, 15-pin

+ Power supply	+ E	1
- Power supply	- E	2
+ Signal voltage (amplified) + S		3
GND	GND	4
Shunt calibration	CAL	5
Cosine signal	COS	6
Sine signal	SIN	7
GND	GND	8
CAN-Hi		9
CAN-Lo		10
GND	GND	11
Autocode	DS	12
GND	GND	13
Reserved		14
Reserved		15

#### ODU flange socket, 19-pin

+ Power supply Tth	+ E	1
+ Compensation Tth	+ C	2
+ Signal voltage Tth	+ S	3
- Signal voltage Tth	- S	4
- Compensation Tth	- C	5
- Power supply Tth	- E	6
Shunt calibration Tth	CAL	7
Autocode	DS	8
GND	GND	9
+ Power supply F	+ E	10
+ Compensation F	+ C	11
+ Signal voltage F	+ S	12
- Signal voltage F	- S	13
- Compensation F	- C	14
- Power supply F	- E	15
Shunt calibration F	CAL	16
Reserved		17
Reserved		18
Reserved		19

#### D-Sub DE flange socket, 25-pin

Channel 1-3		Channel 1-6	
+ 24V	1	+ 24V	1
Q1.1	2	n.c.	2
Q1.2	3	n.c.	3
Q1.3	4	n.c.	4
Q2.1	5	Q5.1	5
Q2.2	6	Q5.2	6
Q2.3	7	Q5.3	7
Q3.1	8	Q6.1	8
Q3.2	9	Q6.2	9
Q3.3	10	Q6.3	10
Supply Q1.1...Q3.3	11	Supply Q5.1...Q6.3	11
I1.5	12	n.c.	12
I1.6	13	n.c.	13
I1.7	14	n.c.	14
I1.8	15	n.c.	15
I2.5	16	I5.5	16
I2.6	17	I5.6	17
I2.7	18	I5.7	18
I2.8	19	I5.8	19
I3.5	20	I6.5	20
I3.6	21	I6.6	21
I3.7	22	I6.7	22
I3.8	23	I6.8	23
Supply I1.5...I3.8	24	Supply I5.5...I6.8	24
0V	25	0V	25

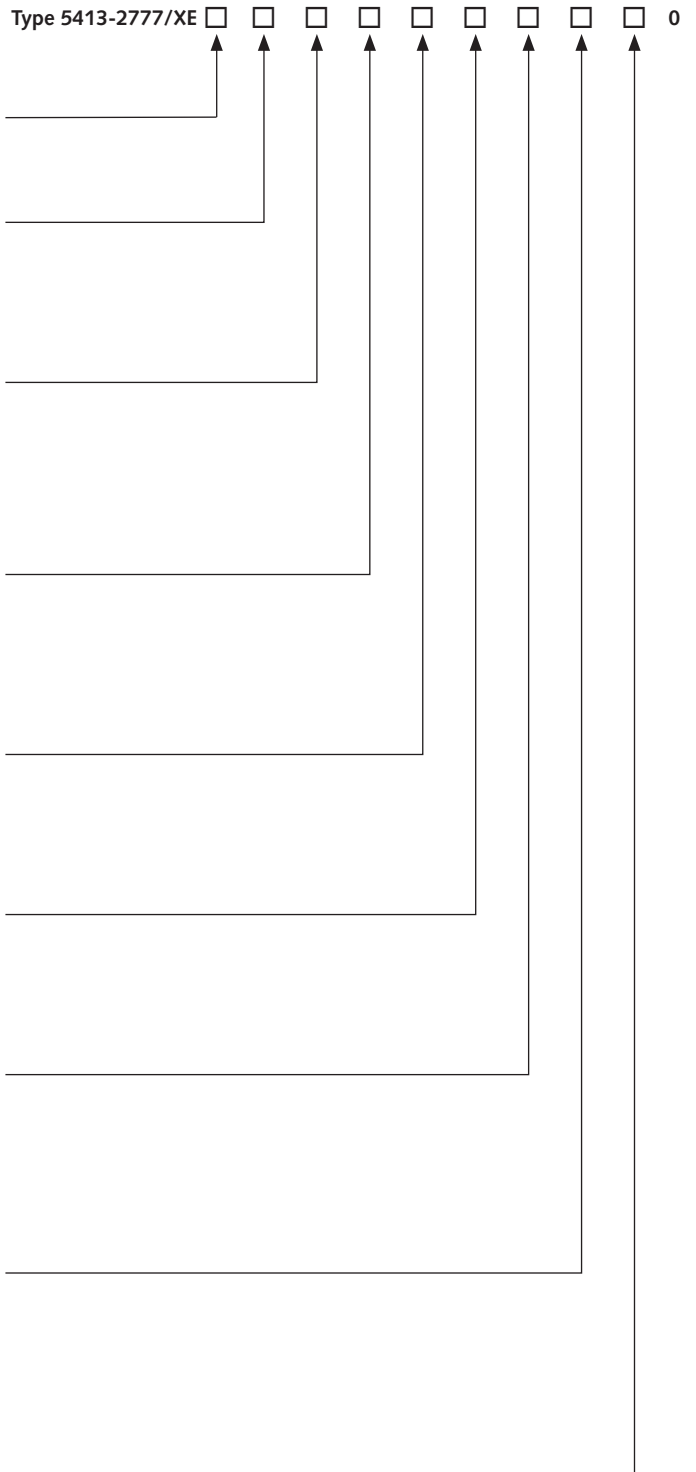
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**Ordering key**

Type 5413-2777/XE           0

Version	
16-bit	1
Channel 1	
A+I passive	1
A+I passive + active	2
Channel 2	
None	0
A+I passive	1
A+I passive + active	2
A passive (for F/T <sub>th</sub> )	5
Channel 3	
None	0
A+I passive	1
A+I passive + active	2
A passive (for F/T <sub>th</sub> )	5
Channel 4	
None	0
A+I passive	1
A+I passive + active	2
Channel 5	
None	0
A+I passive	1
A+I passive + active	2
Channel 6	
None	0
A+I passive	1
A+I passive + active	2
Digital inputs/outputs	
None	0
Channel 1, or ultrasonic	1
Channel 1 ... 2	2
Channel 1 ... 3	3
Channel 1 ... 5 (without channel 4)	5
Channel 1 ... 6 (without channel 4)	6
Vibration interface	
None	0
Channel 4	4



Note: A = analog, I = incremental

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