

Force/Displacement Measuring System Type 4733A...

Multichannel Unit DMF-P A400 advanced

The multichannel force/displacement measuring system Type 4733A... was especially designed for the application in plants and systems with several joining processes, which are monitored independent from each other.

- Forward-backward measurement
- Traction-compression applications
- Possibility of 4-quadrant measurement
- 32 setpoint records per channel
- 8 evaluation functions/windows per setpoint record
- Graphically editable windows
- Multilingual menu
- Additional window types: Hysteresis, breakpoint, gradient, speed, selective teach-in operation
- Online- and offline evaluations
- Statistics with protocol functions
- Logging of measurement results (I-P.M., Q-DAS, csv, txt, ...)
- 100 curve memories per channel, 1 000 measured value memories per channel (can be extended by memory extension)
- Self monitoring and diagnosis
- Open system for later extensions through modular design
- Ethernet 10/100 MBit/s for cross linking
- Fieldbus interfaces (optional)
- PS/2 keyboard interface for simple operation
- Web server for visualization, modification and filing as well as remote-control by PC via ethernet
- Network interconnectivity
- Master sample/master check

Description

The data exchange with a possible extern visualization is done per Ethernet. The coupling to the unit is done by via fieldbus or corresponding control inputs.

The configuration/commissioning is performed by a unit with monitor or a PC with web browser. It was taken care of clear and simple operator guidance. Continuity to the previous devices of the DMF-P series was maintained and extended by additional functions.



Application, Solution for Assembly Operations

The characteristic for the assembly operation is monitored by adjustable windows.

This allows the operator to define the critical part of the assembly cycle.

The system monitors:

- Threading force
- End position
- Overload
- Variable windows

In addition the speed of the process and the slope of the measuring curve can also be measured and evaluated.

Technical Data

General

Power supply	VDC	24 ±10 %
Power consumption	W	<20
Operating temperature range	°C	5 ... 50
Storage temperature range	°C	0 ... 60
Display	LCD 1/4 VGA with background lighting	

Up- and download of setpoint records, external visualization by PC (optional)

Access control via password

Per channel

32 different setpoint records selectable from PLC; 8 windows per setpoint record; 4 different evaluation methods; measured value storage, curve storage, statistics

Measuring Technology

Resolution of analog inputs	bit	12
Scan rate per measuring input	kHz	5
Measuring points per curve		4 000

Y-Channel

Strain gage Supply	V	±1,25/2,5/5/10
	mV/V	0,25 ... 5
Accuracy	% FSO*	0,1
Semiconductor strain gage Supply	mV/V	50 ... 100
Accuracy	% FSO*	0,1
Active Supply	V	±0,5 ... 10
Accuracy	% FSO*	0,1
Piezo Supply	pC	40 000 ... 1 500 000
Accuracy	% FSO*	<1

X-Channel

Resistive Supply	V	±5/10
Accuracy	% FSO*	0,2
Inductive Supply	V/kHz	3,5/eff. 6
Accuracy	% FSO*	0,2
Active Supply	V	±0,5 ... 10
Accuracy	% FSO*	0,1
Incremental	counting range/bit	32
SSI absolute	value range/bit	24

Additional sensors are possible, such as torque/rotation angle

Type 4502A... , Type 4503A...

* without accuracy of the respective sensor

Control Signals

Per channel	16 inputs	Volt/VDC	0/24
PLC	16 outputs	Volt/VDC	0/24
Fieldbus	Profibus/Interbus/DeviceNet/ProfiNet IO/ Ethernet IP		
Modbus			in preparation

Interfaces

Ethernet		Mbit/s	10/100
RS-232C	COM1, COM2	baud	9 600 ... 115 200
Keyboard			PS/2
Printer	LPT		25 pin parallel

Housing Versions

Weight panel housing IP54	kg	4
Weight desktop housing IP40	kg	3,2
Weight wall mounted housing IP53	kg	4,3
Dimensions		see illustrations

Monitoring Processes

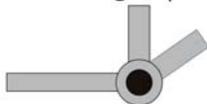
Monitoring of riveting operations



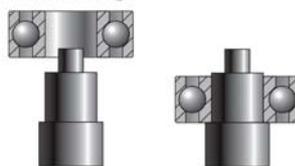
Monitoring of crimping operations



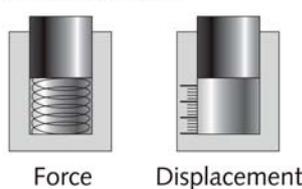
Checking of torque and rotation angle operations



Press-fit monitoring



Classification of



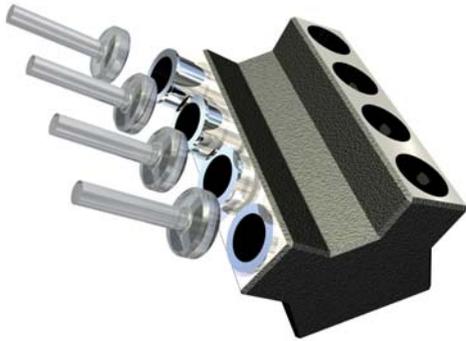
Force

Displacement

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Multichannel Applications

E.g. Engine block



E.g. Dial table

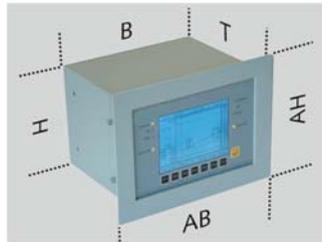


Dimensions

Housing version	B	H	T	AB	AH
Desktop housing	223	158	180	-	-
Panel housing	223	158	180	274	180
Wall mounted housing	228	214	180	228	158



Desktop housing



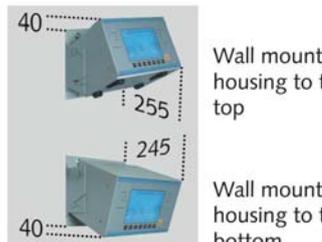
Panel housing



Wall mounted housing



Wall mounted housing with fixing hole



Wall mounted housing to the top

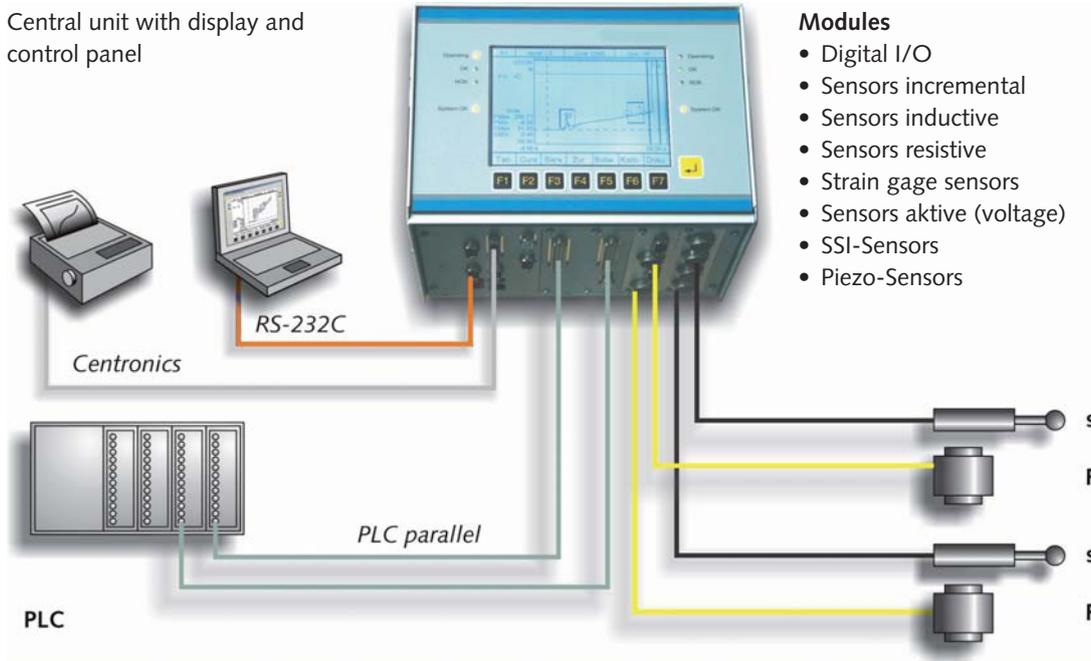
Wall mounted housing to the bottom

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System Configuration

Measurement and Central Unit, Two-Channel Device

Central unit with display and control panel



Modules

- Digital I/O
- Sensors incremental
- Sensors inductive
- Sensors resistive
- Strain gage sensors
- Sensors aktive (voltage)
- SSI-Sensors
- Piezo-Sensors

Measurement and Evaluation

Type 4733A... records the force progression in dependence on displacement or time.

Evaluation is done according to the criteria online or after recording. The criteria are user programmable.

Four evaluation methods with 8 tolerance windows per set-point record are available as standard.

The manufacturer can integrate customer-specific evaluation methods in the system.

The start of a recording is done externally by the superordinated control, either absolute or depending on a programmable trigger threshold of the press force.

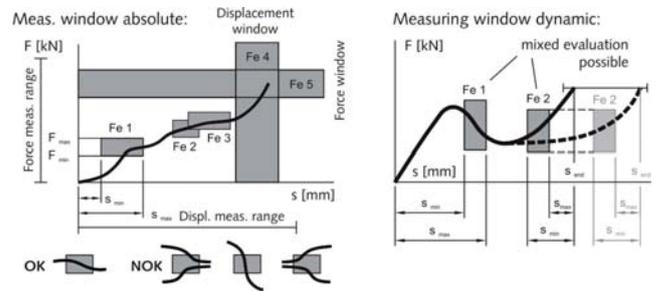
The teach-in procedure supports a punctual evaluation for force and displacement points according to a previously acquired reference curve. Up to 8 force and displacement points may be defined and given a limit.

Further on all approved window types of the unit may be used. The teach-in procedure may be done easily and fast by setting a bit via Fieldbus.

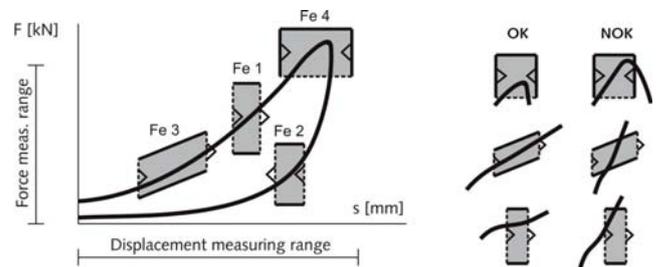
Menu Navigation

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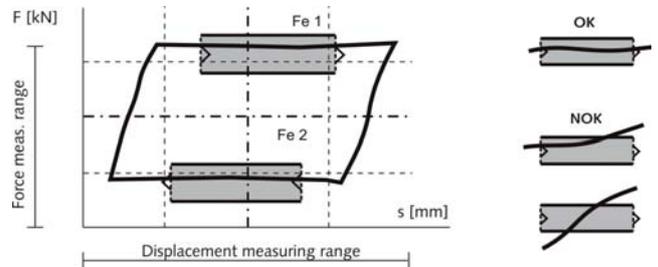
Tolerance Window/Dynamic Measuring Window



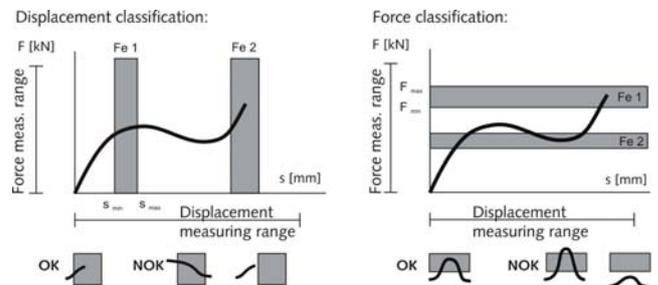
Forward- and Backward Measurement



4-Quadrant Measurement

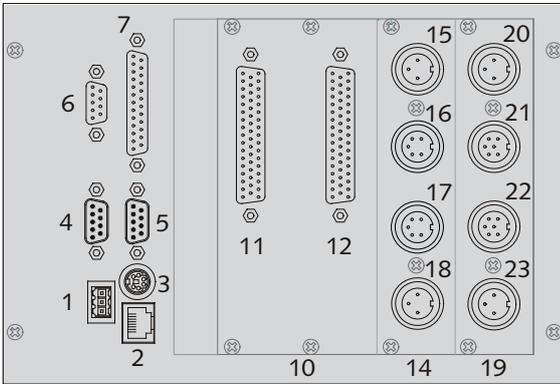


Classing (8 force- or displacement sections, also overlapping)



Interfaces/Accessories

Rear View (Example)

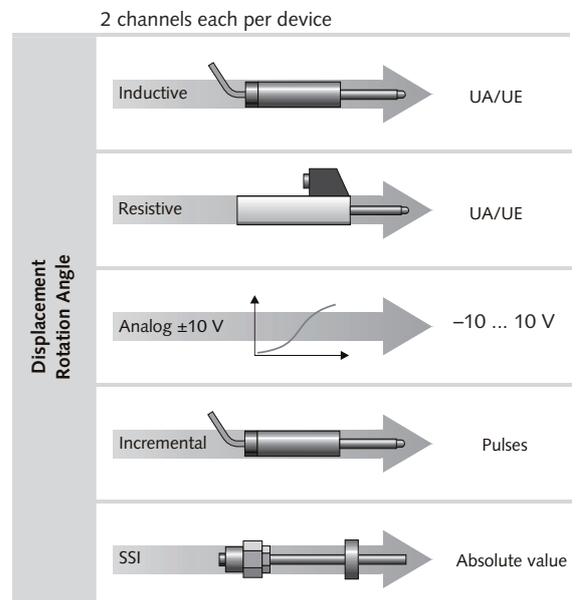
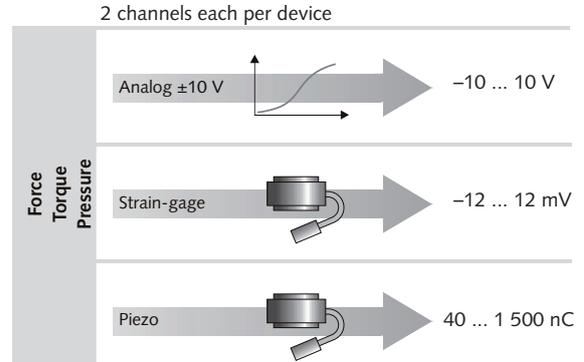


- 1 Supply (24 VDC)
- 2 LAN (Ethernet)
- 3 Keyboard
- 4 Serial interface (COM1)
- 5 Serial interface (COM2)
- 6 Profibus
- 7 Parallel-printer

10 – 23 are dependent on the configuration, further options are possible.

- 10 Digital module I/O
- 11 PLC-channel A
- 12 PLC-channel B
- 14 Displacement sensors module
- 15 Displacement monitor output channel A
- 16 Displacement input channel A
- 17 Displacement input channel B
- 18 Displacement monitor output channel B
- 19 Force sensors module
- 20 Force monitor output channel A
- 21 Force input channel A
- 22 Force input channel B
- 23 Force monitor output channel B

Measuring Modules



4733A_000-623e-04_10

This information corresponds to the current state of knowledge. Kistler reserves the right to make technical changes. Liability for consequential damage resulting from the use of Kistler products is excluded.

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Included Accessories

- Power connector
- Cover for connector
- Mating plug complete D-Sub 50 pin

Type/Art. No.

- KSM027661
- KSM022694
- KSM009307

Optional Accessories

- 24 V power supply (120 ... 240 V)
- 24 V power supply (120 ... 240 V) US-plug

Type/Art. No.

- KSM028659
- KSM028660

Ordering Key

Housing versions

Wall mounted housing	W
Desktop housing	T
Panel housing	E

Display LCD 1/4 VGA

with Display	D
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Sensor input (y-channel) Force

Strain gage	Y1
Aktiv ±0,5 ... 10 V for ext. CA*	Y2
Piezo 500 000 pC	Y3
Piezo 1 500 000 pC	Y4
Aktiv ±0,5 ... 10 V	Y5

Sensor input (x-channel) Displacement

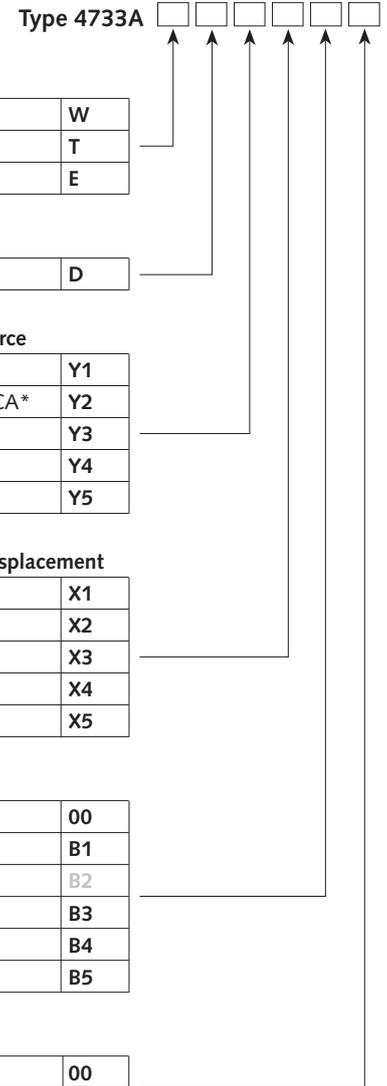
Inductive	X1
Resistive	X2
24 V active	X3
SSI	X4
Incremental	X5

Fieldbus

Profibus	00
Interbus	B1
Modbus (in preparation)	B2
DeviceNet	B3
ProfiNet IO	B4
Ethernet IP	B5

Digital Interface

Without	00
Parallel 2x16 I/O	S1



Order Example: Type 4733AWDY3X20000

Multichannel force/displacement measuring system **Type 4733A...**
 DMF-P A400, Version **W**: Wall mounted housing, **D**: with Display,
Y3: Piezo 500 000 pC, **X2**: x-channel resistive, **00**: Profibus,
00: without digital interface

* Measuring card for external charge amplifier
 e.g. ICAM Type 5073A... or MiniAmp Type 5030A...

4733A_000-623e-04.10