MEASURING PINS

also with INTERNAL A/D ELECTRONICS — SERIES MD 5000

APPLICATIONS AND CONSTRUCTIVE FEATURES

The *pin load cells Series MD 5000* substitute standard pins, supplying electrical signals proportional to the load applied to them.
These measuring pins *are installed* on industrial machines; in substitution of pins of wheels, of pulleys, of cranes, of hydraulic actuators and for the measures of fix and mobile plants and reservoirs.
The Series MD 5000 include models "*Standard*" and "*Long*" which differ between them for the length of the central body (=G) (see overall dimensions). The models "*Standard*" are normal production. In the models "*Long*", the length G can be whatever, provided that the unitary stress σf on this length does not exceed 20÷25 Kg/mm.
To reach this condition, the central sleeve of the pulley, of the wheel, etc. has to have a sufficient stiffness and thickness.

Some constructive features:

- **Body of the pin:** in solid rod (not a tube): to increase the flexional strength on the central section (G) and the shear strength on the lateral cavities.
- **Strain-gauge sensors:** on all the diaphragms of the 4 cavities: to increase the linearity and the insensitivity to the position of the applied load.
- **Extreme sturdiness:** the pins, in high strength steel, are sized up for an operational load double (1 mV/V FS) compared to that of standard load cells (2 mV/V FS).
- **Use outdoor and in environmental industrial conditions:** the cavities and the end cover are filled and sealed by water-repellent and high insulating silicon gel and rubber.
- **Electrical connections and electronics:** held inside the end cover.

ADVANTAGES OF THE INTERNAL A/D ELECTRONICS (options):

- *Analog electronics (-A)*: zero (tare) regulation from outside, insensitivity to the cable length and better insensitivity to the external electrical disturbances.
- *Digital electronics (-D)*: all settings are performed by a remote computer: zero (tare) suppression, conversion to mechanical units (Kg, tons, etc.), calibration and operating controls of all the measuring system, alarm (threshold) levels and their hysteresis (CAN), 8 points of customized linearization, up to 32 feasible transducers connected to an only line strongly free from electrical disturbances (ask for the bulletin: "Transducers with digital electronics").

All the internal electronics have *CE certification* for emission and immunity to electromagnetic disturbances.

MEASURING PINS: TECHNICAL SPECIFICATIONS:

Measuring ranges: from 1 a 60 ton. (See the table below).
Sensitivity: 1 mV/V FS, typical.
Maximum error (non-linearity + hysteresis + temperature effect on sensitivity): < ±0,2 % FS.
Temperature effect on zero within 5°K: < ±0,1 % FS.
Creep: < ±0,15 % FS, during 4 hours test at FS.
Safe load limit: 200% FS (see note).
Ultimate load limit: about 5 times FS (see note).

Note: *the value limits of safe and of ultimate loads have to be considered for static loads uniformly distributed on the bearings E-G and coincident with the weighing axis. For dynamic loads, with shocks and vibrations the max load applied has to be reduced.*

INTERNAL A/D ELECTRONICS (options): TECHNICAL SPECIFICATIONS:

• **Analog electronics** (suffix: -A):

Voltage amplifiers:
- **A5** = supply: 10,5 to 28 Vdc; output: 0 to 5 V.
- **A10** = supply: 18 to 28 Vdc; output: 0 to 10 V.

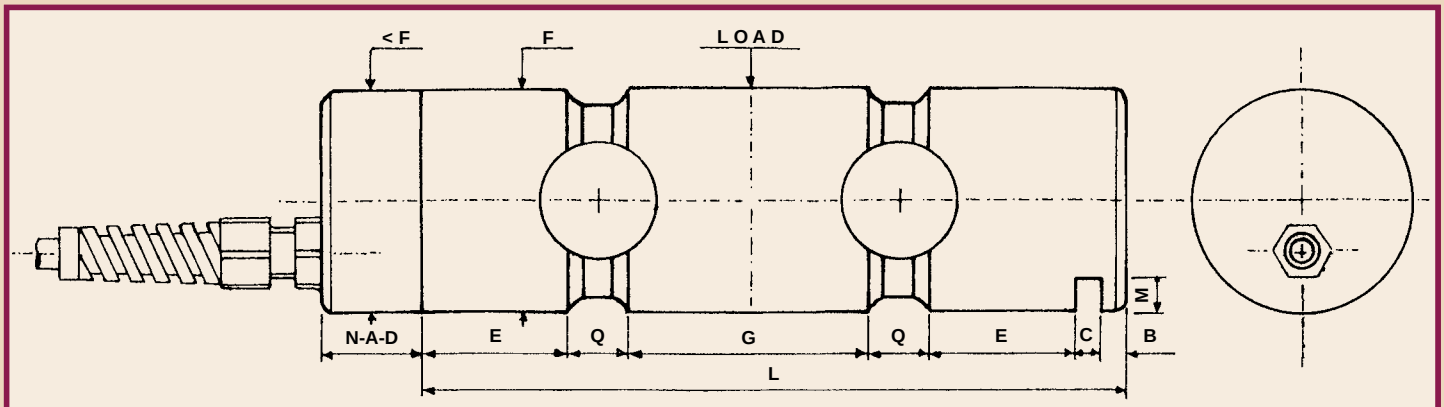
Current amplifier:
- **A4** = supply: 18 to 40 Vdc; output: 4 to 20 mA.

• **Digital electronics:** (suffix: -D).

- Digital outputs: **- D2x** = RS 422 and RS 485. **-D4x** = CAN
- Protocol (x): **- D20** = DSEbus, **-D21** = Modbus,
  - D40 = CAN layer 2; **-D41** = CAN open (DSP 406); **- D42** = Devicenet.
- A/D Converter: 24 bit max (Sigma Delta).
- Bandwidth: from zero to 1,94 Hz up to 390 Hz (-3 dB), depending on A/D update frequency.
- Baud rate: from 1200 to 115.200 baud (RS 485/442) or 1 Mbit max for CAN.
- Analog output (option): from 0 to 5 V (12 bit D/A).
- Operating temperature range: from -20 to +70°C; **Rh** < 95 %.

SOME EXAMPLES OF MEASURING SYSTEMS WITH DS EUROPE UNITS:

1) A pin Series MD 5000 + external analog conditioner 694: analog output + 2 (4) threshold relays.
2) A pin Series MD 5000 + external digital display AN 201 or AN 401: optional computer connection.
3) A pin Series MD 5000 with internal electronics + digital display AN 201 or AN 401: optional computer connection.
4) A pin Series MD 5000 with internal digital electronics: direct connection to a computer (optional display).



MODEL	LENGTH	full scale	overall dimensions		bearings		free-lengths		cover without or with electronics			groove	
		tons	F (g 6)	L	E	G	B	Q	N=No electric	A=Analog	D=digital	C	M
MD 5005 S	Standard	1 - 3 - 5	40	110,2	16	32	5	18	19	35	45	5,2	6
MD 5005 L	Long			78,2 + G		>32							
MD 5015 S	Standard	10 - 15	50	180,2	33,5	67	5	18	19	35	45	5,2	6
MD 5015 L	Long			113,2 + G		>67							
MD 5025 S	Standard	25	70	180,2	33,5	67	5	18	19	35	45	5,2	8
MD 5025 L	Long			113,2 + G		>67							
MD 5060 S	Standard	40 - 60	100	303,2	63	126	7	18	19	35	45	8,2	10
MD 5060 L	Long			177,2 + G		>126							

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