

Retractable Assembly *CleanFit CUA 451*

**Manually operated stainless steel assembly
with ball valve
for the turbidity sensors CUS 31, CUS 41 and CUS 65**



Application

- Primary sludge and return activated sludge in sewage treatment plants
- Sludge centrifuge monitoring
- Filter monitoring and filter backwash
- Monitoring of phase break processes
- Cooling water monitoring

Your benefits

- Safety:
 - Safe and reliable process termination possible under nearly all conditions
 - Process pressure up to 10 bar (145 psi), manually operated up to 2 bar (29 psi)
- Comfortable operation:
 - Cleaning possible due to rinse water connection
 - Rinse water connection can be used as sealing water inlet
 - Sensor monitoring and cleaning without process interrupt

Function and system design

Function



The assembly is manually operated.

Caution!

The air relief valve and the rinse connections (if used) are in open contact with the medium in the measuring position, or at least when moving, and are thus exposed to the process pressure. Make sure that, the air relief valve and the rinse connections (if used) are closed when moving the assembly .

General sequence when moving the retractable assembly

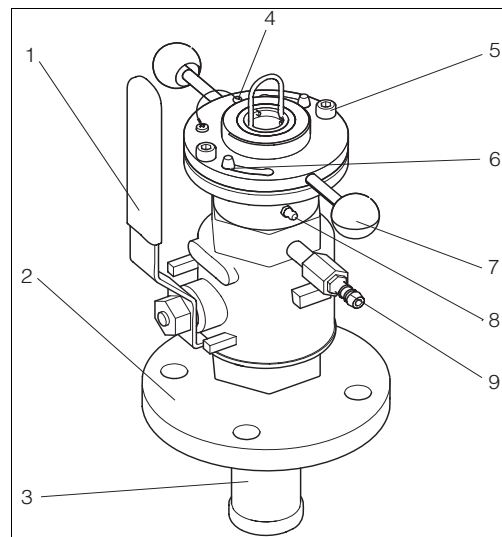
- from position "Service" to position "Measure"
 - Open the ball valve (see fig. below, pos. 1)
 - Move the sensor into the process: press down the handle (pos. 6) of the sensor holder (pos.3)
 - Close the bayonet joint (pos. 5)
 - Fasten the fastening screws (pos. 4)
- from position "Measure" to position "Service"
 - Loosen the fastening screws
 - Open the bayonet joint
 - Move the sensor off the process: pull up the sensor holder by means of the handle
 - Close the ball valve

In the "Service" status (sensor moved back into the assembly and **ball valve closed**), the ball valve seals the assembly off from the process. This means that cleaning and calibration can take place and electrodes can be changed without interrupting the process.



Caution!

Manually moving the assembly under process conditions is only possible at a process pressure up to 2 bar (29 psi).



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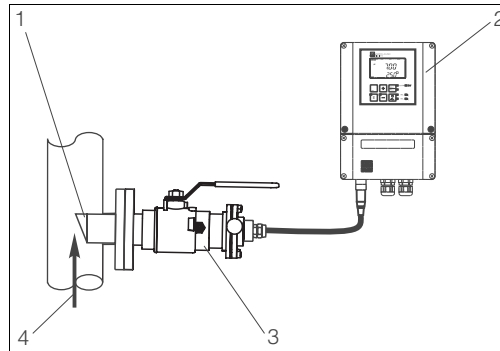
Assembly in measuring mode (ball valve open)

- 1 Hand lever for ball valve open/close
- 2 Process connection (Flange DN 50 / PN 16)
- 3 Outer sleeve
- 4 Locking pin
- 5 Fastening screws
- 6 Bayonet joint
- 7 Handle
- 8 Lubricator nipple
- 9 Air relief valve resp. rinse water connection

Measuring system

A complete measuring system comprises:

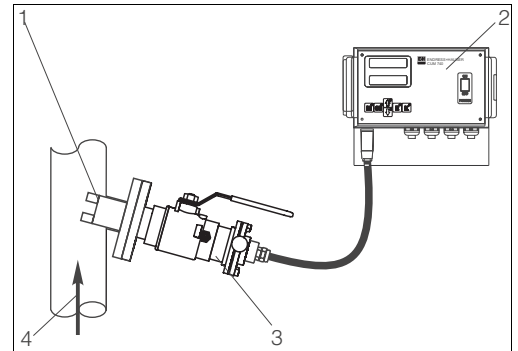
- CleanFit CUA 451 assembly
- TurbiMax W CUS 41/CUS 31 or TurbiMax W CUS 65 (with CUM 740 only) turbidity sensor
- Liquisys M CUM 223/253 or CUM 740 (with CUS 65 only) transmitter



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Measuring system with CUS 31 resp. CUS 41

- 1 CUS 31 or CUS 41
- 2 Liquisys M CUM 253
- 3 CUA 451
- 4 Medium flow direction



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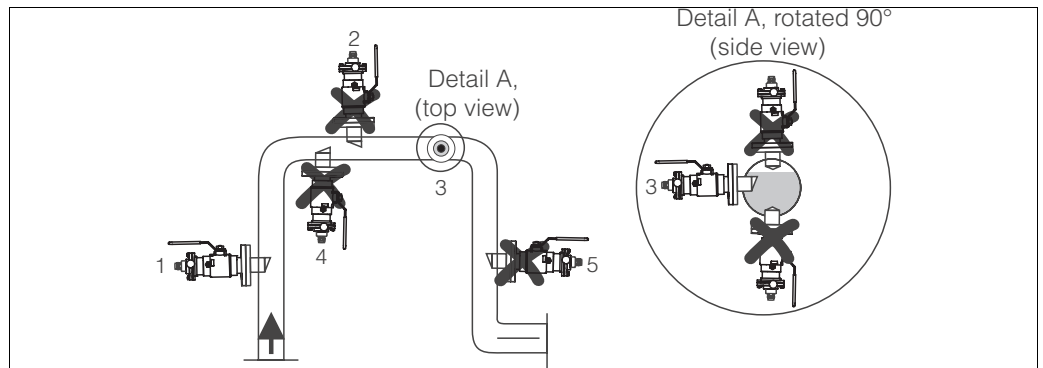
Measuring system with CUS 65

- 1 CUS 65
- 2 CUM 740
- 3 CUA 451
- 4 Medium flow direction

Installation

Installation conditions

Install the assembly at places with constant flow. The minimum pipe diameter is DN 80.



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Permissible and impermissible sensor installation positions

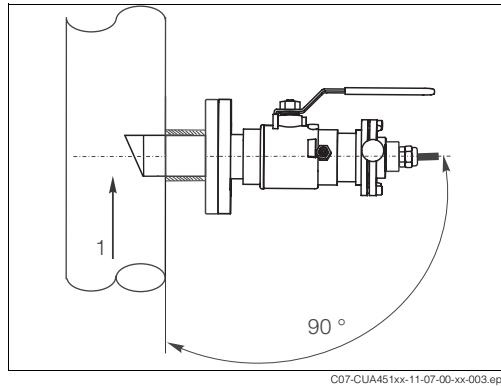
- 1 Ascending pipe, best position
- 2 Horizontal pipe, sensor top down, impermissible due to air cushion or foam bubble forming
- 3 Horizontal pipe, installation with permissible emitting angles (acc. to sensor version)
- 4 Overhead installation, impermissible due to suspended particle settling on the sensor optics
- 5 Down pipe, impermissible



Note!

- Do not install the assembly at places, where air cushions or foam bubbles can be formed or where suspended particles can settle on the sensor optics (→ Fig.).
- Measuring errors can occur, if:
 - the sensor is not immersed into the medium
 - suspended particles are settled on the sensor optics.

Orientation

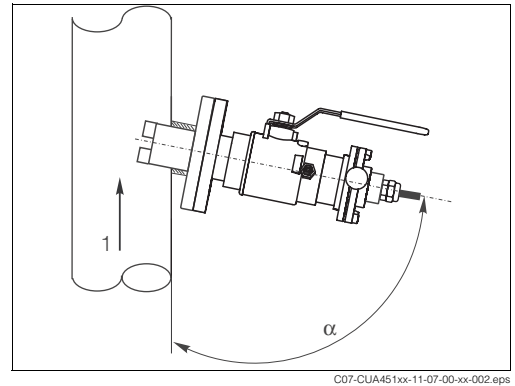


Orientation with CUS 41

1 Medium flow direction

Orientation acc. to sensor version:

- | | |
|-----------------------------|----------------------|
| – CUS 31, CUS 41, CUS 65-B: | $\alpha = 90^\circ$ |
| – CUS 65-A: | $\alpha = 80^\circ$ |
| – CUS 65-C, E: | $\alpha = 100^\circ$ |
| – CUS 65-D: | $\alpha = 110^\circ$ |



Orientation with CUS 65

α depending on sensor version, see below
1 Medium flow direction

Environment

Ambient temperature range

0 ... 50 °C (32 ... 122 °F)

Process

Medium pressure

max. 10 bar (145 psi)



Caution!

- The maximum process pressure is 2 bar (29 psi) for manual assembly operation!
- Please consider the sensor process conditions!

Medium temperature

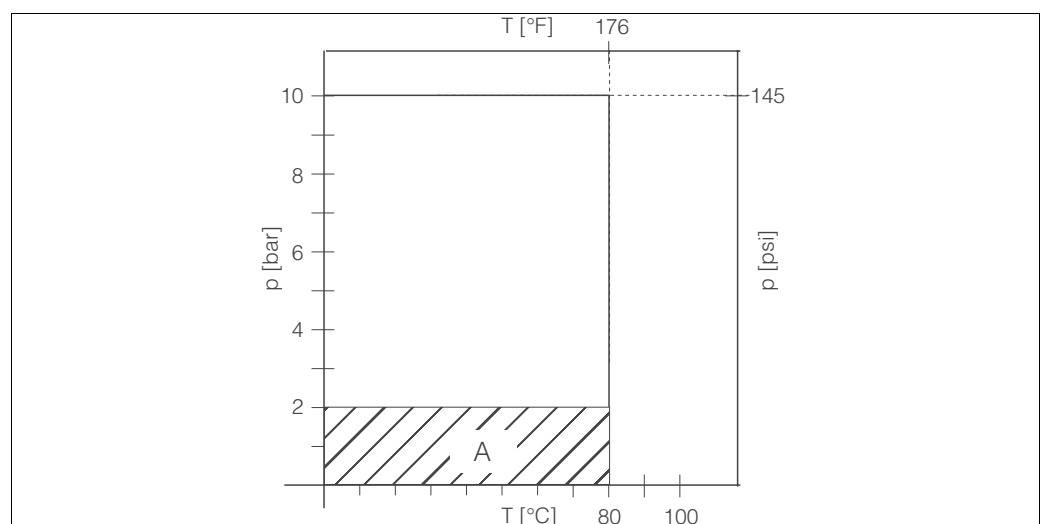
0 to 80 °C (32 to 176 °F)



Caution!

Please consider the maximum sensor process temperature!

Pressure-temperature diagram

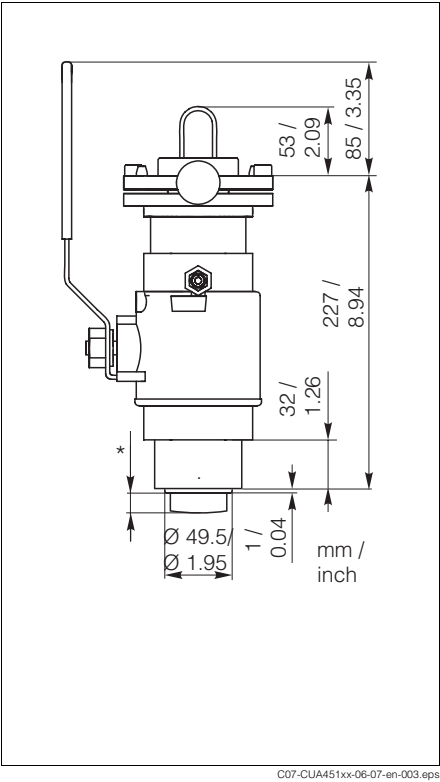


Pressure-temperature diagram

A Manual operation range

Mechanical construction

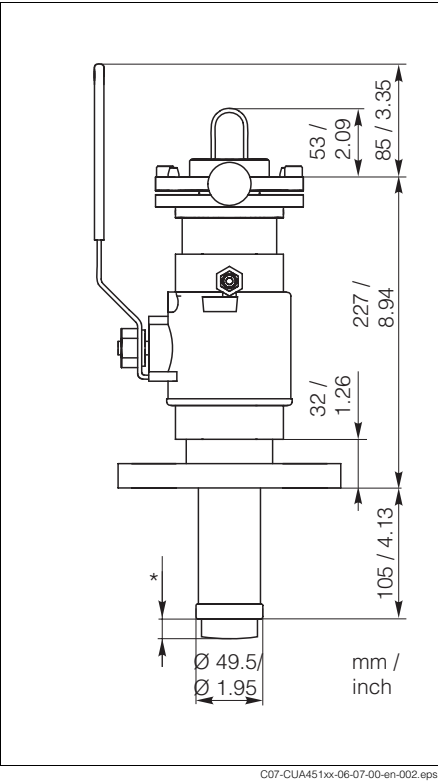
Design, dimensions



Assembly with welding neck (short lift)

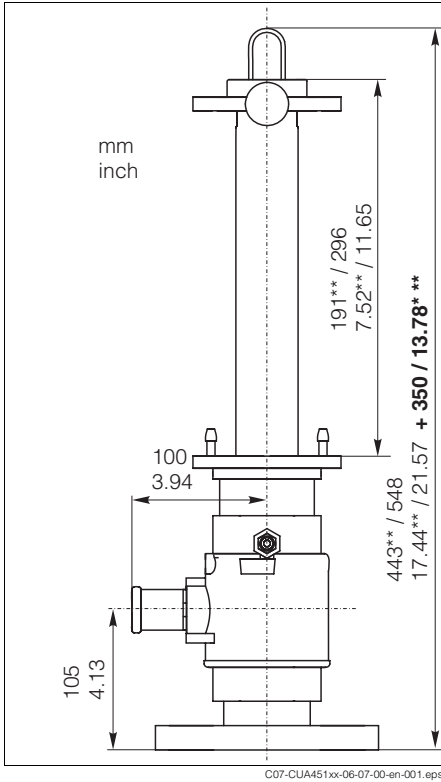
* Dimensions depend on sensor, see below

*** There must be additional space of 350 mm (13.78") for sensor installation!



Assembly with flange connection (long lift)

* Dimensions depend on sensor, see below



Assembly in service position

** Assembly version with short lift (see product structure)

* Dimension acc. to sensor type:

CUS 31/41: 14 mm (0.55") / 20 mm (0.79") with wiper

CUS 65-A/B: 19 mm (0.75")

CUS 65-C: 12 mm (0.47")

CUS 65-D: 10 mm (0.39")

CUS 65-E: 7 mm (0.28")

Fitted sensors

CUS 41 / CUS 31 or
CUS 65

Weight

8 - 11 kg (17.6 ... 24.3 lb) depending on the assembly version

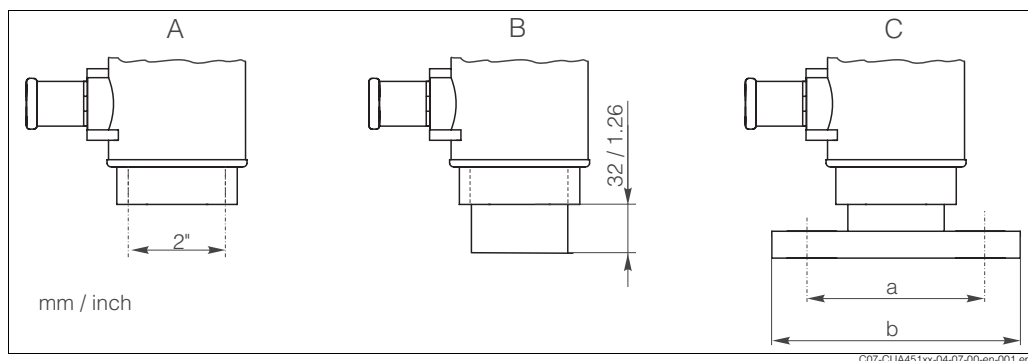
Materials

In contact with medium:

Viton (seals)
stainless steel 1.4404 (AISI 316L)
nickel brass (air relief valve resp. rinse connection)

Not in contact with medium:

stainless steel 1.4404 (AISI 316L)

Process connections*Process connections*

- A Internal thread G2
 B Internal thread G2 with welded fitting
 C Flange DN 50 / PN 16 and Flange ANSI 2" / 150 lbs
 a: DN 50: Ø 125 (4.92"), ANSI 2": Ø 120.7 (4.75")
 b: DN 50: Ø 165 (6.50"), ANSI 2": Ø 152.4 (6.00")

Rinse connection fitting

2 x G1/8 (internal)

Connection options:

- 2 x ball valve with hose connection OD 9 mm (0.35"), see accessories
 (One ball valve is in the scope of delivery. When used alone, it is an air relief valve.)
- customer specific solution, rinse connections with G1/8 external thread

Air relief valve

Hose connection OD 9 mm (0.35")

Ordering information**Product structure**

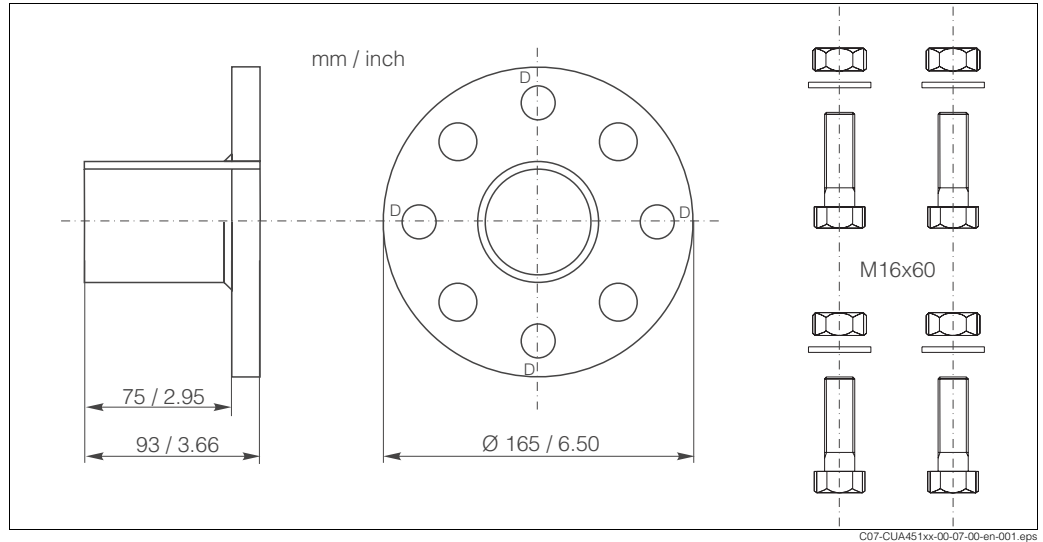
Sensor lift / Immersion depth	
A	Short lift, Immersion depth approx. 170 mm / 6.69" (process connections A and B only)
B	Long lift, Immersion depth approx. 270 mm / 10.63"
Sensor type / Connection	
1	For CUS 31/41 with G1, Sensor length approx. 200 - 220 mm / 7.87 - 8.66"
2	For CUS 65 with G1, Sensor length approx. 140 - 160 mm / 5.51 - 6.30"
Process connection	
A	G2 internal thread
B	G2 internal thread with welded fitting h = 50 mm / 1.97"
C	Flange DN 50 / PN 16 acc. to EN 1092/1
D	Flange ANSI 2" / 150 lbs
CUA 451-	complete order code

Accessories**Assembly**

- ☐ Ball valve for rinse connection; order no. 51512982
- ☐ O-ring set, Viton; order no. 51512981

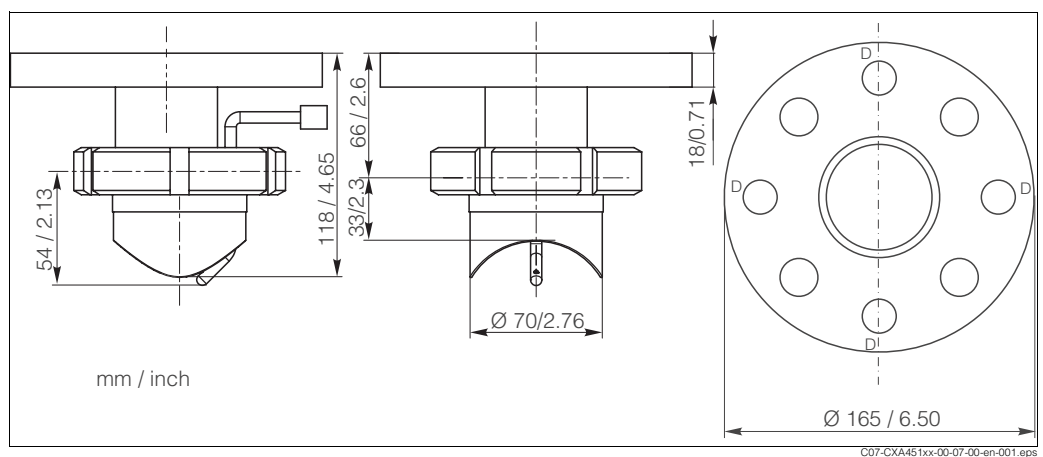
Process connection adapter

- ❑ Welded fitting for pipe diameters of more than 80 mm (3.15"), with combination flange DN 50 / ANSI 2":
- Bore holes for DN 50 flange: 4 x 90° Ø18 (0.71") on hole circle Ø125 (4.92")
 - Bore holes for ANSI 2" flange: 4 x 90° Ø19 (0.75") on hole circle Ø121 (4.76")
- Flange seal, 4 screws M16x60, 4 nuts M16 incl. washers, stainless steel 1.4571 (AISI 316Ti); order no. 50080249

*Welded fitting*

D: Marks for the bore holes of the DN 50 flange

- ❑ Welded rinse fitting DN 65, for automatic cleaning of CUS 31/41 sensors in pipe lines and tanks:
- Bore holes for DN 50 flange: 4 x 90° Ø18 (0.71") on hole circle Ø125 (4.92")
 - Bore holes for ANSI 2" flange: 4 x 90° Ø19 (0.75") on hole circle Ø121 (4.76")
 - Rinse connection: external thread R $\frac{1}{4}$
 - with removable spray head
 - up to 6 bar (87 psi), 80 °C (176 °F)
- order no. 51500912

*Welded rinse fitting*

D: Marks for the bore holes of the DN 50 flange

Sensors

☐ TurbiMax W CUS 31

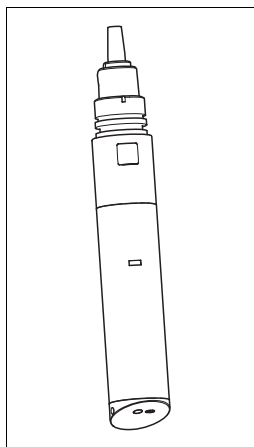
Turbidity sensor for drinking water and waste water applications, 90 ° scattered light method
ordering acc. to product structure, see Technical Information

☐ TurbiMax W CUS 41

Turbidity sensor for waste water and solid content measurements, 90 ° scattered light method
ordering acc. to product structure, see Technical Information

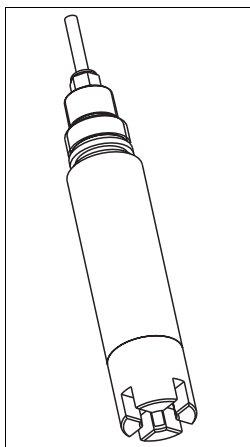
☐ TurbiMax W CUS 65

Turbidity and solid content sensor with various measuring range applications,
backscatter-light method
ordering acc. to product structure, see Technical Information



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TurbiMax W CUS 31 / 41



C07-CUS65xxx-00-05-06-xx-001.eps

TurbiMax W CUS 65

Profiling plates

- ☐ Profiling plates for welded fittings;
order no. 51513623

Documentation

- ☐ Operating Instructions CleanFit CUA 451, BA 369C/07 (order no. 51512838)
- ☐ Technical Information TurbiMax W CUS 31, TI 178C/07 (order no. 50088400)
- ☐ Technical Information TurbiMax W CUS 41, TI 177C/07 (order no. 50088402)
- ☐ Technical Information TurbiMax CUS 65, TI 370C/07 (order no. 51512873)

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