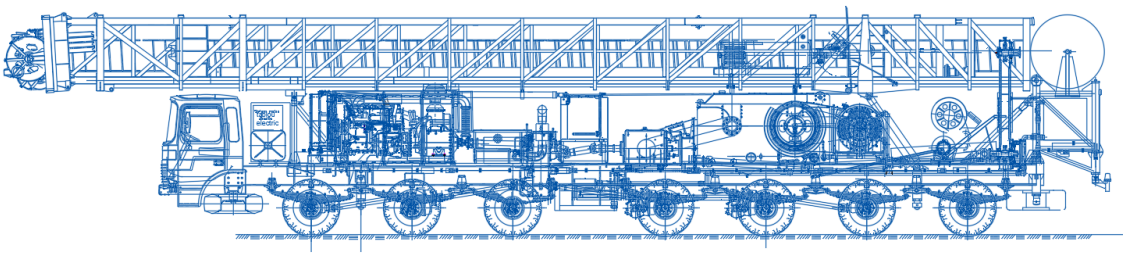
DETAILED TECHNICAL OFFER DOCUMENTATION
NO. 1689



TD 200 CA – A7 DRILLING RIG
truck mounted
(with one drum and mast of 37m)
1080 HP

(operating temperature **- 29°C + 45°C**)

CONTENTS

A. PURPOSE

TD 200 CA – A7 type drilling rig, 87.1080 (14 x 10) truck mounted, with drive from **two Diesel CATERPILLAR C 15 ACERT, STAGE III A engines** and **two Allison M 5620 AR hydro-mechanical transmissions**, performs drilling and servicing operations at oil and gas wells, with mounting possibility and high mobility.

The construction of the drilling rig provides a high-speed during rig-up/rig-down, in case the site operations are properly organized.

The drilling rig blocks and packages have overall sizes and weights authorized for the transportation on public roads by the European Union and CIS member countries.

The rigs manufactured by UPET meet the quality standards imposed by various organizations, as well as **"RULES REGARDING SECURITY IN OIL AND GAS INDUSTRY".**
Authorizing documents of S.C. UPET S.A.:

a) American Petroleum Institute (API) certificates:

- Spec. 4F, issued by API, acc. to the license no. 4F – 0093
- Spec. 7K, issued by API, acc. to the license no. 7K – 0034
- Spec. 8C, issued by API, acc. to the license no. 8C – 0059
- Spec. Q1, issued by API, acc. to the license no. Q1 – 1572

b) Certificates for the management system:

- EN ISO 14001:2015, issued by TUV Austria,
- OHSAS 45001:2023, issued by TUV Austria,
- EN ISO 9001:2015, issued by TUV Austria,

B. TECHNICAL DATA

B.1. General technical data

- Maximum working hook load (on 10 lines) 225 MT
- Hook lifting speed 0,2 ÷ 1,5 m/s
- Working depth for vertical wells:
    - for drilling:
        - with 4 ½" (114.3 mm) (24.7 kg/m) DP 3800 m
        - with 5" (127 mm) (30 kg/m) DP 3100 m

- for servicing:
  - with 3 ½" (89 mm) (19.79 kg/m) DP 6200 m
- Main wire line size 1 1/8 in (28.6 mm)
- Travelling block lines no. 10
- Mast height under the crownblock beam (with rig's truck **overheight** H=164 mm) 37.2 m
- Substructure height under derrick floor level 6.1 m
- Free height, under rotary table beams 5.14 m

- MRL 275 rotary table:
  - opening 698.5 mm (27 ½ in)
  - working speed 30 ÷ 280 rpm
  - maximum torque in rotor speed 2800 kgfm
- Max. length of **double** handled stands when not working with TOP DRIVE 18 ÷ 20 m
- Max. length of double handled stands when working with TOP DRIVE 16.6 - 18 m
- Working height of the monkey board 17.37 m, 16.46 m, 14.8 m
- Road max. speed of the truck mounted rig 30 km/h
- Transport overall sizes, for the truck mounted rig:
  - Height without monkey board ~ 4500 mm
  - Width: 3100 mm
  - Length: ~ 23000 mm
- Environment temperature - 29°C ÷ + *45°C

B.2. Main subassemblies technical data

Truck

- Type 87.1080 MFEG (14x10)
- Wheel formula 14 x 10
- Cabin type medium size (1 + 1 places)
- Axles no., of which: 7
  - driving axle: 5 (1, 2, 4, 5,6)
  - steering axle: 5 (1, 2, 3, 6, 7)
- Max. allowed load per axle: 12500 kg
- Max. design carrying capacity per axle 13500 kg
- Total weight, for the rig in transport position: 87500 kg

Power unit

Engine

- No. 2 pcs
- Type **CATERPILLAR C15 ACERT, STAGE III A**
- Power /rotation speed 540 HP/ 2100 rpm
- Start-up electrical
- Equipped with CATERPILLAR air compressor (2 pcs – one for each engine), which provides the air necessary both for truck's air consumers and for air consumers mounted on the main rig.

Hydro-mechanical transmission:

- No. 2 pcs
- Type **ALLISON M 5620 AR** with incorporated hydraulic torque converter
- Gears no. 5 forward +1 reverse
- Equipped with steering pumps (one on each transmission)

The power unit (2 engines + 2 automatic transmissions) and the summation box are placed on the truck's frame, behind the driver's cabin, and drives both the drawworks and the rotary table of the rig, as well as the truck's front and rear axles. The movement to the truck's front and rear axles is directed by cardans, from the interaxial differential mounted in the **summation and distribution** box.

The summation and distribution box represents a gear drive, which summarizes the power of the two Caterpillar C15 ACERT engines and is provided with **mechanical PTOs for**:

- truck's front and rear axles drive, during oilfield equipment transport
- truck mounted rig components drive/actuation
- the hydraulic pumps

Bevel gear

- Teeth type curved, in circular curve
- Inlet max. dynamic torque 19.30 KNm
- Inlet max. speed 1500 rpm

Drawworks

- Type TF 25 – 1
- Drawworks drums no. 1 pc

Main drum, **with LEBUS groove:**

- Main wire line diameter 1 1/8 in (28.6 mm)
- Max. main wire line pull 25 MT

- Drawworks gears 5 + 1R
- Drum sizes for the wire line, over the groove Ø 558 x 1049 mm
- Braking:
  - with mechanical brake with 2 brake bands
  - with auxiliary hydraulic brake
- Brake drums sizes Ø 1120 x 265 mm
- Brake drums cooling with softened water + antifreeze
- Equipped with crown saver/ device for limiting the movement of the travelling block, driven by the main wire line spooled on the drum

Auxiliary hydraulic brake, FH 560 type, including air clutch

Water system for drawworks brake rims cooling and FH 560 type auxiliary hydraulic brake supply:

- Water tank volume 1400 l
- Working fluid softened water + antifreeze
- Pumping unit:
  - type PO - L65x50 - F or similar
  - pressure 45 m.col. H_2O
  - flow 22 m^3/h
  - electric motor ASU -132 Sb (400V / 50 Hz)
  - power 7.5 kW
- Fan drive electric motor power 4 kW (400V / 50 Hz)

The system for drawworks brake rims cooling and auxiliary hydraulic brake supply is mounted on the side, next to the rig.

Inverter for rotary table

- Tooth type cylindrical, with bent teeth
- Inlet max. torque 9.50 KNm
- Inlet max. rotation speed 1400 rpm

Mast

- Type MU 200 – 37, acc. to API 4F
- Maximum hook load (on 10 lines) 225 MT
- Adaptations for mounting Top Drive Drillmec HTD -250 CR (code S000010965) 250 MT
- Construction:
  - telescopic, two sections, “U” shaped, with acoustic signaling at the end of telescoping
  - high resistance trusses of **square pipe**
- Mast height under the crownblock beam 37.2 m

(with rig's truck **overheight** H=164 mm)

- Mast free height from derrick floor under the crownblock beam (**with overheight** H=164 mm) ~ 31 m
- Telescoping 1 single-effect hydraulic cylinder
- Raising 2 double effect hydraulic cylinders
- Equipped with:
  - 2 power anchors (crownblock – truck chassis)
  - 2 power anchors (lower section of the mast – truck chassis)
  - 4 safety anchors (crownblock to ground)
  - 2 monkey board to ground anchors
  - 2 monkey board to crownblock anchors

  All anchors are equipped with stretchers.

- Wind max. speed, **with hook load, with pipes** at monkey board and **with** safety anchors 46 km/h
- Wind max. speed, **without hook load**, **with pipes** at monkey board and **with** safety anchors 110 km/h
- Wind max. speed, **without hook load, without pipes** at monkey board and **with** safety anchors 140 km/h
- Equipped with:
  - mast raising and telescoping hydraulic cylinders are fitted with hydraulic devices (relief valves and releasable directional valves) at their connection joints in order to prevent mast free falling at hydraulic system failure
  - stairs at mast and protection at mast stairs to monkey board upper level
  - monkey board, equipped with protection panels, with tarpaulins, around the monkey board platform, with monkey board fastening (from derrick floor) to 16,46 m and 17,37 m
  - escape device, GERONIMO type and fall protection system when climbing the mast, with retractable fall stopper
  - mast normal and safety lighting electrical system, with automatic connection of the safety lighting when the normal lighting is disconnected, including red lamp for beaconing, on the crownblock frame
  - 4" x 350 bar standpipe

Crownblock

- Type GF 200 – 6 x 28,6, acc. to API 8C, PSL 1
- Maximum static hook load (10 lines) 225 MT
- Sheaves no. 6 main sheaves
- Wire line diameter 28.6 mm (1 1/8 in)
- Sheaves outer diameter:
  - running sheave 914 mm (36 in)

- deadline sheave 762 mm (30 in)
- main sheaves 762 mm (30 in)

Hydraulic system

- Maximum working pressure 200 bar
- Hydraulic pumps used:
  - 2 hydraulic pumps mounted on the summation box, for the rig rigging up, (levelling, mast raising and mast telescoping) for the drive of the hydraulic device for tubular parts break out and for the drive of a hydraulic tong (provided by the beneficiary)
  - 1 hydraulic electro-pump, for the drive of the hydraulic winches (2 pcs)
  - 1 hydraulic electro-pump for the re-circulation of the hydraulic fluid/oil

Air (pneumatic) system

- Working pressure 10 ÷ 11 bar
- Air source for the air consumers within the truck mounted rig
  - from the compressors mounted on the CATERPILLAR engines. CATERPILLAR
  - No of compressors 2 pcs
  - Debit (each) 900l/min

The air system is fitted with 2 pcs. of air driers, WABCO type, and with two tanks with alcohol, for filling in industrial alcohol within the air system (during rig operations at low temperatures).

Hydraulic device for tubular parts break-out (BREAKER), composed of a hydraulic cylinder, mast mounted, which drives the multidimensional manual tongs tail, through some wire lines. Breaker's control shall be performed from the driller's panel.

- Hydraulic working pressure 175 bar
- Wire line max. pull, at 175 bar 96 KN
- Max. working stroke 1800 mm
- Wire line diameter 20 mm

TH 4 type auxiliary hydraulic winch, with 4 MT rated load. Hydraulic winch control is performed from the hydraulic control panel, from the substructure, near the V-door ramp.

- Max. working pressure 175 bar
- Wire line used Ø 14
- Wire line length ~ 100 m

Travelling block

- Type MC 200 – 5 x 28,6, acc. to API 8C, PSL 1
- Construction:
  - monoblock, with travelling block incorporated hook, with 3 hanging points (two for the links and one for the swivel bail) and dampener with spring

- Maximum static hook load 225 MT
- Sheaves no. 5 pcs
- Wire line diameter 28.6 mm (1 1/8 in)
- Sheaves outer diameter 762 mm (30 in)

Power and lighting electric system, for the main rig

- Supply voltage:
  - for rig lighting 230 V / 50 Hz
  - for driving the rig auxiliary mechanisms 400 V / 50 Hz
  - for emergency lighting (from the accumulator batteries) 24 V DC
- Electric cables 1 set

NOTE: The electric system, in the potential explosive areas, is of **explosion-proof** construction.

Substructure (acc. to API 4F)

- Construction foldable
- Height under derrick floor 6100 mm
- Free height under rotary table beams 5140 mm
- Maximum load at rotary table beams 1770 kN (200 tons)
- Setback maximum load 2x785 kN (2x88 tons)
- Combined rotary table-setback capacity 3340 kN (376 tons)
- Substructure raising in working position is performed with the rig travelling block, through a raising device

Rotary table

- Type MRL 275, acc. to API 7K
- Opening 698.5 mm (27 ½ in)
- Maximum speed 300 rpm
- Maximum static load 500 MT
- Rotor maximum rotation torque 2800 kgfm

Operation safety devices

- Hook load limiter
- Crown saver/travelling block stroke limiter
- Acoustic warning at the end of mast telescoping
- Hydraulic system oil pressure limiter
- Air system air pressure limiter
- Oil and air filters
- Indicator for hydro-mechanical transmission oil temperature
- Emergency and warning lamps for engine running

- Indicators of engine cooling liquid temperature and oil pressure

Mechanization units

- Rig leveling using the 4 hydraulic jacks, with centralized control
- Mast raising and telescoping by means of hydraulic cylinders
- Tubular parts break out device, hydraulically actuated – 2 pcs
- Auxiliary hydraulic winch, located on the truck's frame – 2 pcs
- Tongs balancing device, with counterweights
- Humidity automatic discharge from the air system
- Automatic switching on of safety lighting when normal lighting is switched off
- Quick-couplings/detachable connectors for assembling and disassembling the external circuits from the hydraulic, pneumatic, and electric systems

Night time facilities

- Mast and travelling block route lighting
- Crown block frame beaconing lamps
- Monkey board lighting
- Substructure lighting
- Well cellar lighting
- Rig electric lighting system

Operator/labour protection facilities

- Mast cylinder air breather and mast topside telescoping cylinder air breather, truck floor controlled
- Escape device
- Driller to monkey man acoustic communication system
- Explosion proof electric lighting system
- Mast safety lighting, including red beaconing lamp
- Baskets/protection to mast ladders up to monkey board upper level
- Mast topside section ladder
- Monkey board and substructure protection panels
- Jumper bars to prevent wire line fall from the crownblock sheaves
- Beam with pulley block for changing the crownblock sheaves and for safe climbing to crownblock
- All moving parts guards
- Fall protection system when climbing the mast and when maintenance personnel is servicing the crownblock

C. COMPONENTS

Specification "A" – MAIN RIG

Item no.	Subassembly name/description	Qty.
Section 1 – TRUCK MOUNTED SUBASSEMBLIES		
1.	MFEG 87.1080 (14x10) truck equipped with: - 15.5/80 R 20 Michelin type tires - Spare wheel support	1 (14+2spares) (1)
	Cardan gear between engines and summation box	1 set
2.	Power unit including: - CAT C 15 ACERT, STAGE III A engine– 540 HP/2100 rpm - Allison M 5620 AR hydro-mechanical transmission with incorporated hydraulic converter; - PTO for steering pump; - double steering hydraulic pump; - air compressor, engine mounted, used both for the truck and for the main rig	1 set (2) (2) (2) (2)
3.	Summation and distribution box (CSD), including: - emergency steering pump =1 pc - CSD greasing pump =1 pc - hydraulic pump, for rig hydraulic system = 2 pcs.	1 set
4.	Coolant system	1 set
5.	Engine muffler including muffler provision elements and mufflers protection (exhaust system)	1 set
6.	Truck adaptations, including: - mud flaps fixing - truck cabin protection system	1 set (1 set) (1)
7.	Truck frame mounting/fixing parts	1
8.	Cardan gear, between summation box and bevel gear, including cardan, with connection parts	1
9.	Bevel gear, excluding connecting elements to the drill string saving unit.	1
10.	Bevel gear – drawworks chain drive	1
11.	TF 25 drawworks with 1 drum, including: - main drum - LEBUS groove for main drum - wire line reel - crown saver/travel block stroke limiter	1

	- band brake for main drum	
12.	Drawworks brake control system	1
13.	Hydraulic brake system, including: - FH 560 hydraulic brake, left sense of direction - rim for bellows clutch	1 (1) (1)
14.	Drawworks – FH 560 chain drive, including bellows clutch	1
15.	Inverter for rotary table	1
16.	Cardan gear at the rotary table	1
17.	Rotary table transmission I	1
18.	Dead line anchor, ASI 27	1
19.	Hydraulic system, including: - rig rigging up hydrostatic system - hydraulic winch drive hydrostatic system - breaker drive hydrostatic system - PTO for power hydraulic tong supply - hydraulic cylinders venting hydrostatic system - hydraulic elements for remote control (mast raising and telescoping) - guards for panels and pipes protection	1
20.	Hydraulic jacks	4
21.	Hydraulic jacks fastening	1 set
22.	Main hydraulic cylinder/raising cylinder, including cylinder's hood	2
23.	Air system, including: - driller control panel - WABCO air dryer; - alcohol tank; - air PTO - air devices, connection pipes, etc.	1
24.	Hook load limiting device	1
25.	Crown saver/device for limiting the travel block stroke, drawworks mounted	1
26.	MU 200- 37 mast, acc. to API 4F, including: - crownblock frame - GF 200-6x28.6 crownblock, with 6 main sheaves, acc. to API 8C, PSL 1 - stable/fixed section - main cylinder beam - gin pole and pulley block - mast side stabilizers - mast locking-unlocking device - mast ladders and protection. The protection baskets to be mounted up to the monkey board upper level - supports for fixing other subassemblies on the mast	1 (1) (1) (1) (1) (1) (1) (1) (1 set)

		(1 set)
27.	Standpipe of 4" x 350 bar	1
28.	Travelling block bed	1
29.	Hydraulic telescoping system, including: - hydraulic cylinder - cylinder hood	1
30.	Telescoping hydraulic cylinder rod stabilizer	1
31.	Hydraulic breaker (N 1 and 2), including: - 1 hydraulic cylinder mounted on mast - wire line Ø 20 - system for hydro-pneumatic control of the beaker (N 1 and 2)	1 set
32.	Mast front canopy	1
33.	MC 200 - 5 x 28,6 Travelling block, acc. to API 8C, PSL 1, with 5 sheaves for wire line of Ø 28,6 mm	1
34.	Main wire line ϕ 28,6 mm (1 1/8"), IWRC, 6x19, for rated load 578 KN, acc. to API 9 A, L= (380+120) m	1
35.	Spare wireline drum support skid	1
36.	Spare wheel support	1
37.	Rig protection panels/guards	1
38.	Allison control system	1
39.	Engine's parameters tracking system	1
40.	Power and light electric system for the main rig **(50 Hz; 400 V / 230 V; 24 VDC),** including: - *electric board - mast and monkey board lighting - derrick floor and cellar lighting - PTO for main rig subassemblies lighting - spare PTO - PTO for driller's cabin - PTO for electric system for hydraulic brake supply and brake rims cooling system - PTO for hydraulic station - electric cables and quick couplings - drilling rig grounding including access stairs and handrails grounding - supports and protections for cables * **NOTE:** Electric board energy supply shall be performed from the **DECAF** which is **provided by the beneficiary**	1
41.	Rig electric lighting system	1
42.	Oil drip pans	1

43.	TH 4 MT hydraulic winches, N 1 and 2, mounted on truck's frame including adaptations and wire line (with presser roll)	1 set
44.	Road safety elements for circulation on public roads	1
Section 2 – SEPARATELY TRANSPORTED SUBASSEMBLIES (NOT MOUNTED ON TRUCK CHASSIS)		
45.	Foldable substructure, acc. to API 4F, adapted for the operation with PKR 560 M-OP, with pole for tongs, and two holes (for square Kelly and Kelly insertion) - derrick floor height: 6.1 m - free height under rotary table beams: 5.14 m	1
46.	Substructure raising/folding-unfolding system	1
47.	Protection panel (**H = 3000 mm**) and stair to the substructure mounted from ground to substructure's working platform along the rig towards truck's front side. The stair is provided with handrails (**H = 1250 mm**).	1
48.	Rotary table transmission II	1
49.	Monkey board protection panels **(H = 2200 mm)** and handrails	1
50.	Fall prevention system, which does not allow the pipes falling from the mast, at wrong handling. It is mounted below the monkey board.	1
51.	Mast safety anchors from crownblock frame to ground, including anchors stretcher	1 set (4 pcs)
52.	Monkey board-ground anchors, including anchors stretcher device	1 set (4 pcs)
53.	Mast power anchors, from mast to chassis, including: - crownblock frame – truck anchor (2 pcs.) - downside section – truck anchor (2 pcs)	1 set (4 pcs)
54.	Monkey board – mast anchors	1 set (2 pcs)
55.	GERONIMO type escape device	1
56.	Tongs balancing device, with counterweights, for manual multidimensional tongs	1
57.	Fall protection system while climbing on mast, including: - hanging system - safety belt, harness type - retractable fall stopper	1set
58.	V-door ramp with stairs	1
59.	Standpipe platform	1
60.	BOP handling system, including: - crossbeams for hoist trolleys hanging - hoist trolley 10000 kgf.	1 (2) (2)
61.	Water system for drawworks brake rims cooling and FH 560 type auxiliary hydraulic brake supply, in a container, **mounted near the rig**, including electro-pump, connection pipes, etc.	1

62.	Electric system for hydraulic brake supply and brake rims cooling, including electric board	1
63.	Cooling system for the drawworks	1
64.	Hydraulic jacks support	1 set (4 pcs)
65.	Intermediate mechanical jacks support	1 set (2 pcs)
66.	Stable/fixed section mechanical jacks and mast stabilizers support	1 set
67.	Monkey board, including side platform	1
68.	Rig side platforms, including handrails	1
69.	Hydraulic station, in a container, including: - oil tank - hydraulic electro-pumps - hydraulic devices - hydraulic connections - skid for fixing the component elements of the hydraulic station, including fastening elements	1
70.	Electric system for hydraulic station, including: - electric board - electric system for electro-pumps supply - electric cables and quick couplings - supports and protections for cables	1
71.	Substructure tarpaulins, including: - derrick floor tarpaulins - cellar tarpaulins	1 set
72.	Monkey board tarpaulins	1 set
73.	Drill string saving unit mounted on truck's frame **Technical data:** - travelling block hook maximum handled load 140 MT - travelling block hook lifting speed 0.81 m/min Including: - electric motor and reducer - power electric system - adaptation elements	1 set (1) (1) (1 set)
74.	Adaptation elements for hydraulic power tongs fitting, including: - hydraulic power tongs hanging system - hydraulic power tongs supply hydraulic system including hoses, pipes, quick joints, valve, gauge, valve, etc. - air system for air cylinder supply and hydraulic power tongs PTO control **NOTE:** Hydraulic power tongs shall be **provided by the beneficiary**	1 set
75.	Acoustic and visual signaling system at rig protection panels raising	1 set
76.	Cardan protection guards	1 set

77.	Quick joints on the drilling rig for mast quick dismounting during rig transport, including: - quick joints to the hydraulic system - quick joints to the pneumatic system - quick joints to the electric system	1 set (1 set) (1 set) (1 set)
78.	Mast raising and telescoping command system from distance of 50 m, including: - mobile command and control panel	1 set (1)
79.	CH 200 swivel, acc. to API 8C, with 6 5/8"REG-LH connection to the square kelly **Technical data:** - maximum static load (no rotation) 200 MT - maximum working pressure 350 bar - maximum speed 300 rpm - fluid passing diameter 76 mm - reducing part to kelly connection thread 6 5/8" REG-LH - gooseneck to Rotary hose connection thread LP 4" API -STD 5B	1
80.	MRL 275 rotary table, acc. to API 7K	1
81.	Rig truck overheight with **H = 164 mm**	1
82.	Driller's cabin, including adaptations for the rig, which includes:	1 set
82.1	Driller's cabin, which consists of 2 compartments: - working compartment - resting compartment Outside dimensions of the driller' cabin: ~4576x2438x2590 mm	(1)
82.2	Metal support for fixing the driller's cabin	(1 set)
83.3	Elements for fixing the control and command panels	(1 set)
83.4	Control and command panel, in the driller's cabin, including: a) pneumatic/air board b) board for control monitoring drilling parameters (to be **provided by the beneficiary or can be additionally provided by UPET**) c) board/module for monitoring engines parameters d) speed selector shift e) Emergency STOP button	(1)
83.5.	System of levers, including the breaks lever, in the driller's cabin	(1 set)
83.6	Electrical system for the driller's cabin, including: - Lighting electrical system - Venting electrical system - Quick couplings and connecting wire cables	(1)
83.7	Pneumatic/air system elements for the driller's cabin, including: - Air system for rigging up	1 set (1)

	- Air connectors between the rig and the driller's cabin, including quick couplings - Adaptation elements for the air board in the driller's cabin	(1 set) (1 set)
84.	Fixing elements for the balancing system of the hydraulic multidimensional tongs	1 set
85.	Analogic indicator for hook load	1
86.	Protection guards for motors/engines and moving parts	

NOTE: The manufacturer of TD 200 CA – A7 may perform modifications inside its components without notifying the beneficiary if they don't influence the operational characteristics of the product.