

NEF SERIES

Industrial application

N60

N60 ENT

This publication describes the characteristics, data and correct methods for repair operations on each component of the vehicle.

If the instructions provided are followed and the specified equipment is used, correct repair operations in the programmed time will be ensured, safeguarding against possible accidents.

Before starting to perform whatever type of repair, ensure that all accident prevention equipment is available and efficient.

All protections specified by safety regulations, i.e.: goggles, helmet, gloves, boot, etc. must be checked and worn.

All machining, lifting and conveying equipment should be inspected before use.

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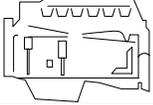
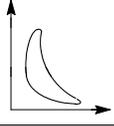
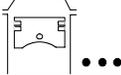
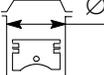
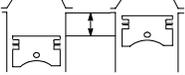
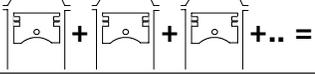
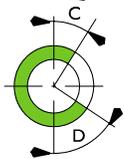
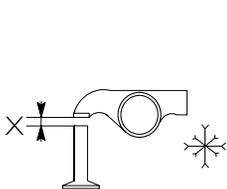
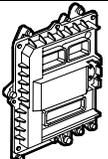
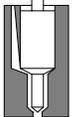
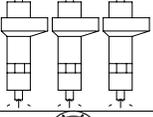
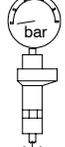


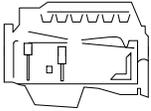
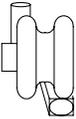
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CORRESPONDENCE BETWEEN TECHNICAL CODE AND COMMERCIAL CODE

Technical Code	Commercial Code
F4AE0484B*DI..	N40 ENT
F4AE0684C*DI..	N60 ENT

SPECIFICATIONS

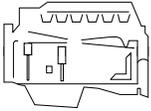
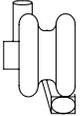
	Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines	
	Cycle	Four-stroke diesel engine		
	Power	Turbocharged with intercooler		
	Injection	Direct		
	Number of cylinders	4 in-line	6 in-line	
	Bore	mm	102	
	Stroke	mm	120	
	Total displacement	cm ³	3920	5880
	TIMING			
	 start before T.D.C.  end after B.D.C.	A B	18.5° 29.5°	
	 start before B.D.C.  end after T.D.C.	D C	67° 35°	
	Checking timing	 × {  mm  mm	- -	
	Checking operation	 × {  mm  mm	0.20 to 0.30 0.45 to 0.55	
	FUEL FEED			
	Injection Type:	Bosch	high pressure common rail EDC7 ECU	
	Nozzle type	Injectors		
	Injection sequence	1 - 3 - 4 - 2	1 - 5 - 3 - 6 - 2 - 4	
	Injection pressure bar	250 - 1450		

4 cyl. engines - N40 ENT Series			TECHNICAL CODE	
	Type		F4AE0484B * D I..	
	Compression ratio		17 : 1	
	Max. output	kW (HP)	107 145	
		rpm	2300	
	Max. torque	Nm (kgm)	490 49.0	
		rpm	1200	
	Loadless engine idling	rpm	-	
	Loadless engine peak	rpm	-	
	Bore x stroke		102 x 120	
	Displacement		3920	
	TURBOCHARGING		with intercooler	
	Turbocharger type		GARRETT GT 22	
	LUBRICATION		Forced by gear pump, relief valve single action oil filter	
	Oil pressure (warm engine)			
	- idling	bar	0.7	
	- peak rpm	bar	4.0	
	COOLING		By centrifugal pump, regulating thermostat, heat exchanger, intercooler	
	Water pump control		Through belt	
	Thermostat			
	- start of opening	°C	82.2	
	FILLING			
	engine sump	liters	5.3	
	15W40 ACEA E3 engine sump + filter	liters	6.3	



Data, features and performances are valid only if the technician fully complies with all the installation requirements provided by Iveco Motors.

Furthermore, the use of the unit after overhaul should conform to the original specified power and engine rev/min for which the engine has been designed.

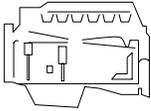
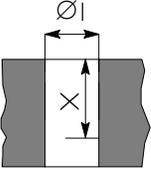
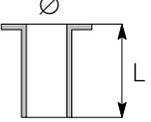
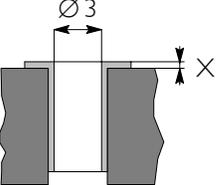
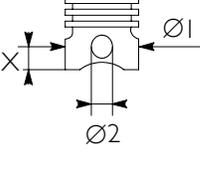
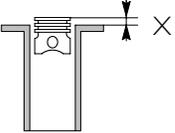
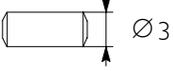
6 cyl. engines - N60 ENT Series			TECHNICAL CODE
	Type		F4AE0684C * DI..
	Compression ratio		17 : 1
	Max. output	kW (HP)	155 210
		rpm	2300
	Max. torque	Nm (kgm)	810 81.0
		rpm	1250
	Loadless engine idling	rpm	-
	Loadless engine peak rpm	rpm	-
	Bore x stroke		102 x 120
	Displacement		5880
	TURBOCHARGING		with intercooler
	Turbocharger type		HOLSET HX35W
	LUBRICATION		Forced by gear pump, relief valve single action oil filter
	Oil pressure (warm engine)		
	- idling	bar	1.2
	- peak rpm	bar	3.8
	COOLING		By centrifugal pump, regulating thermostat, heat exchanger, intercooler
	Water pump control		Through belt
	Thermostat		
	- start of opening	°C	81 ± 2
	FILLING		
15W40 ACEA E3	engine sump	liters	15
	engine sump + filter	liters	15 + 1

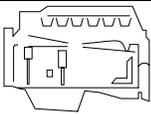
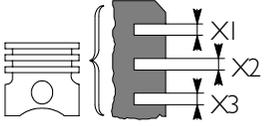
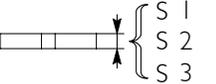
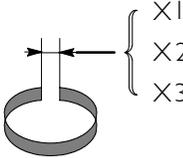
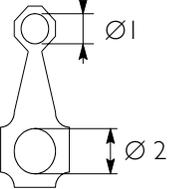
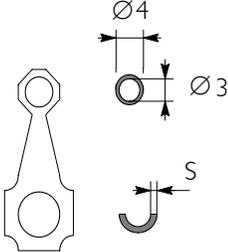


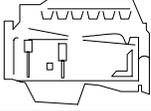
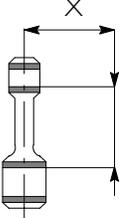
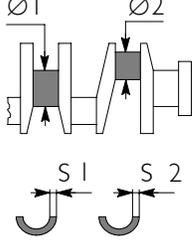
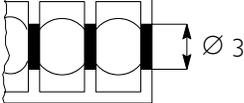
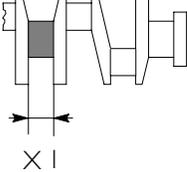
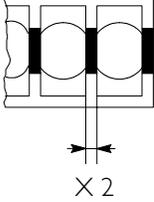
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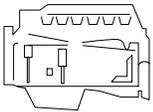
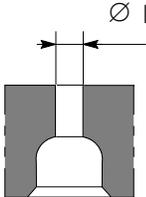
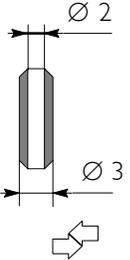
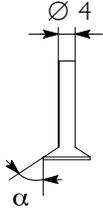
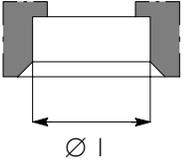
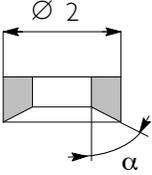
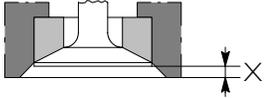
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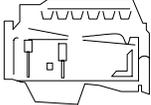
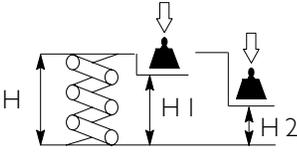
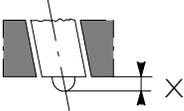
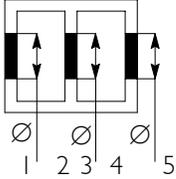
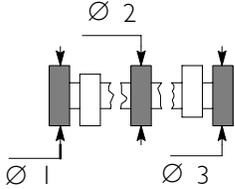
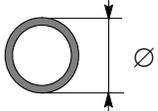
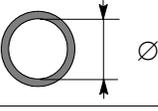
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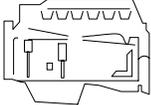
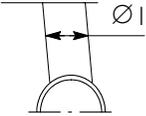
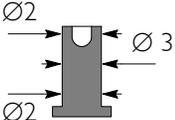
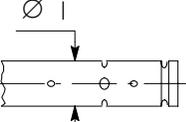
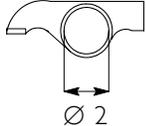
	Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER UNIT AND CRANKSHAFT COMPONENTS		mm	
	Cylinder barrels  Ø1	102.01 to 102.03	
	Cylinder barrels: outside diameter Ø 2 length L	- -	
	Cylinder barrels – housings on engine block (interference)	-	
	Outside diameter Ø 2	-	
	Cylinder barrels: inside diameter  Ø 2	-	
	Spare pistons type: Size X Outside diameter Ø 1 Pin housing Ø 2	12 101.883 to 101.897 40.008 to 40.014	
	Piston – cylinder barrels	0.113 to 0.147	
	Piston diameter Ø 1	0.5	
	Piston protrusion X	0.28 to 0.52 0.28 to 0.52	
	Piston pin Ø 3	39.9968 to 40.0032	
	Piston pin – pin housing	0.0048 to 0.0172	

	Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER UNIT AND CRANKSHAFT COMPONENTS			
mm			
	Split ring slots * measured on 98 mm Ø 4 cyl. * measured on 99 mm Ø 6 cyl. * measured on 101 mm Ø F4HE	X1* X2 X3	2.705 to 2.735 2.420 to 2.440 4.020 to 4.040
	Split rings	S 1 S 2 S 3	2.560 to 2.605 2.350 to 2.380 3.975 to 4.000
	Split rings - slots	1 2 3	0.100 to 0.175 0.040 to 0.900 / 0.060 to 0.110 0.020 to 0.065 / 0.040 to 0.083
	Split rings		0.5
	Split ring end opening in cylinder barrel:	X1 X2 X3 X1 X2 X3	0.22 to 0.32 / 0.30 to 0.40 0.60 to 0.85 / 0.60 to 0.80 0.25 to 0.55
	Small end bush housing Big end bearing housing	Ø 1 Ø 2	42.987 to 43.013 72.987 to 73.013
	Small end bush diameter Outside Inside Spare big end half bearings	Ø 4 Ø 3  Ø 4 Ø 3 S	43.279 to 43.553 40.019 to 40.033 1.955 to 1.968
	Small end bush – housing		0.266 to 0.566
	Piston pin – bush		0.0362 to 0.0158
	Big end half bearings		0.250 to 0.500

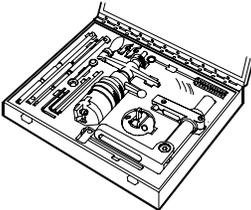
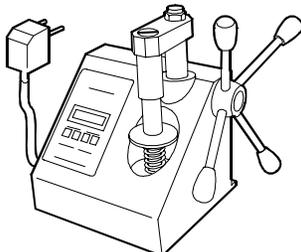
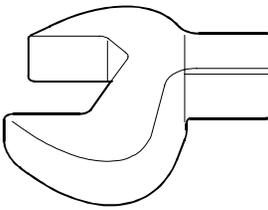
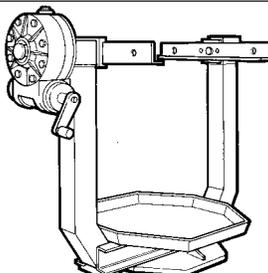
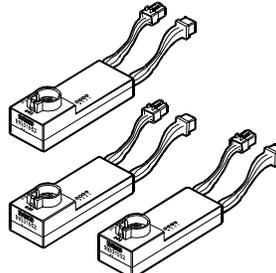
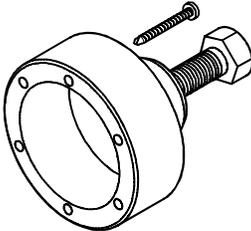
	Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER UNIT AND CRANKSHAFT COMPONENTS		mm	
	Size X Max. tolerance on connecting rod axis alignment =	-	
	Journals Ø 1 Crankpins Ø 2 Main half bearings S 1* Big end half bearings S 2* *provided as spare part	82.99 to 83.01 68.987 to 69.013 2.456 to 2.464 1.955 to 1.968	
	Main bearings No. 1-5 / 1-7 Ø 3 No. 2-3-4 / 2-3-4-5-6 Ø 3	87.982 to 88.008 87.977 to 88.013	
	Half bearings – Journals No. 1-5 / 1-7 No. 2-3-4 / 2-3-4-5-6	0.041 to 0.119 0.041 to 0.103	
	Half bearings - Crankpins	0.033 to 0.041	
	Main half bearings Big end half bearings	+ 0.250; + 0.500	
	Shoulder journal X 1	37.475 to 37.545	
	Shoulder main bearing X 2	25.98 to 26.48	
	Shoulder half-rings X 3	37.28 to 37.38	
	Output shaft shoulder	0.068 to 0.410	

 Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER HEAD – TIMING SYSTEM		
mm		
 Valve guide seats on cylinder head	Ø 1	7.042 to 7.062 7.042 to 7.062
 Valve guides	 Ø 2 Ø 3	- -
 Valve guides and seats on head		-
 Valve guides		-
 Valves:	 Ø 4 α  Ø 4 α	6.970 to 6.999 60° ± 0.25° 6.970 to 6.999 45° ± 0.25°
 Valve stem and guide		0.043 to 0.092
 Housing on head for valve seat:	 Ø 1  Ø 1	34.837 to 34.863 34.837 to 34.863
 Valve seat outside diameter; valve seat angle on cylinder head:	 Ø 2 α  Ø 2 α	34.917 to 34.931 60° 34.917 to 34.931 45°
 Sinking	×  × 	0.59 to 1.11 0.96 to 1.48
 Between valve seat and head	 	0.054 to 0.094 0.054 to 0.094
 Valve seats		-

 Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER HEAD – TIMING SYSTEM		
mm		
 Valve spring height: free spring H under a load equal to: 339.8 ± 19 N H1 741 ± 39 N H2		47.75 35.33 25.2
 Injector protrusion X		-
 Camshaft bush housings No. 1-5/1-7 Camshaft housings No. 2-3-4/2-3-4-5-6		59.222 to 59.248 54.089 to 54.139
 Camshaft journals: 1 ⇒ 5 Ø 1 ⇒ 7 Ø	53.995 to 54.045	54.005 to 54.035
 Camshaft bush outside diameter: Ø		-
 Bush inside diameter Ø		54.083 to 54.147
 Bushes and housings on block		-
 Bushes and journals		0.038 to 0.162
Cam lift: 		6.045 7.582

 Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER HEAD – TIMING SYSTEM		
mm		
 Tappet cap housing on block Ø 1	16.000 to 16.030	
 Tappet cap outside diameter: Ø 2 Ø 3	15.924 to 15.954 15.960 to 15.975	
 Between tappets and housings	0.025 to 0.070	
 Tappets	-	
 Rocker shaft Ø 1	21.965 to 21.977	
 Rockers Ø 2	22.001 to 22.027	
 Between rockers and shaft	0.024 to 0.062	

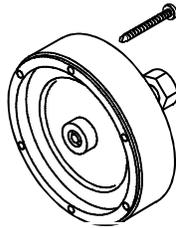
TOOLS

TOOL NO.	DESCRIPTION
99305018	 Kit for valve seat regrinding
99305047	 Spring load tester
99317915	 Set of 3 pin wrenches (14 - 17 - 19 mm)
99322205	 Revolving stand for overhauling units (700 daN/m capacity, 120 daN/m torque)
99331052	 Adapter for measures on engine injectors (use with 99395872)
99340055	 Tool to remove output shaft front gasket

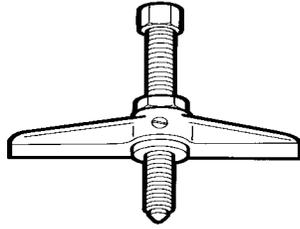
TOOLS

TOOL NO.

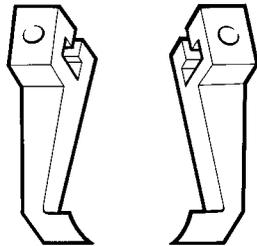
DESCRIPTION

99340056

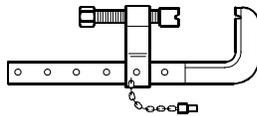
Tool to remove output shaft rear gasket

99341001

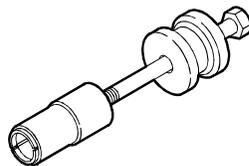
Double acting puller

99341009

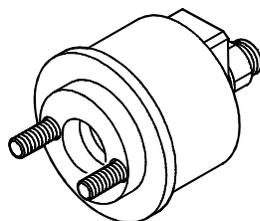
Pair of brackets

99341015

Press

99342101

Tool to remove injectors

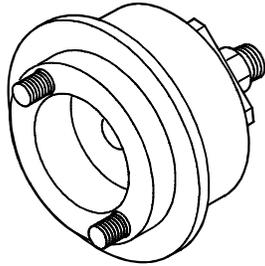
99346252

Tool for fitting output shaft front gasket

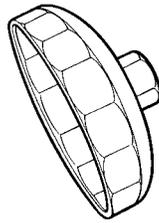
TOOLS

TOOL NO.

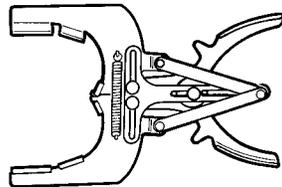
DESCRIPTION

99346253

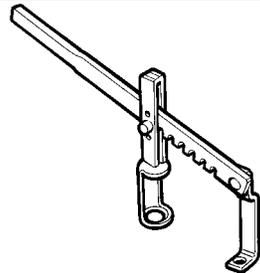
Tool for fitting output shaft rear gasket

99360076

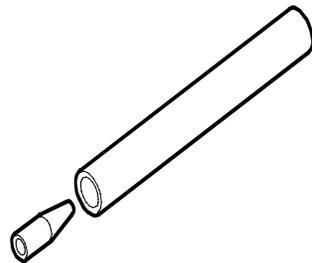
Tool to remove oil filter (engine)

99360183

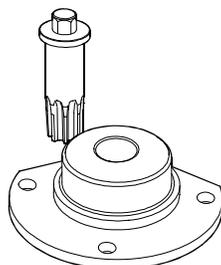
Pliers for removing/refitting piston rings (65 – 110 mm)

99360268

Tool for removing/refitting engine valves

99360292

Keying device for seal assembly on the valve guide

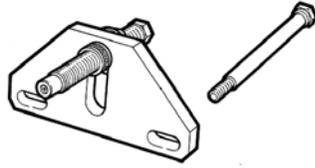
99360339

Tool for rotating/stopping the engine flywheel

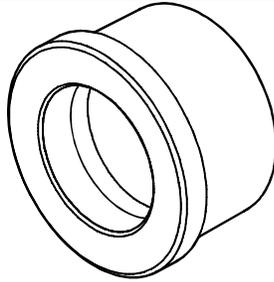
TOOLS

TOOL NO.

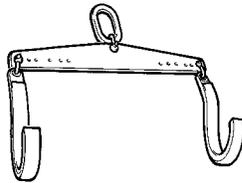
DESCRIPTION

99360351

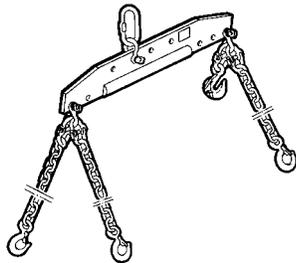
Equipment for flywheel holding

99360362

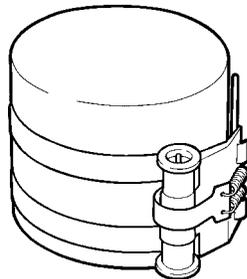
Beater for removing/refitting camshaft bushes (to be used with 993700069)

99360500

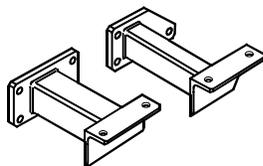
Tool for lifting the output shaft

99360595

Lifting rig for engine removal/refitting

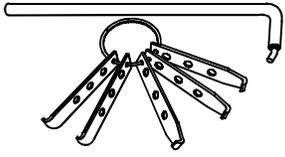
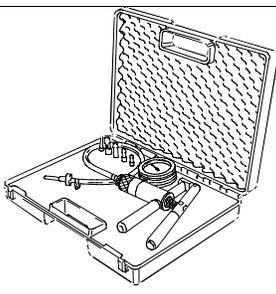
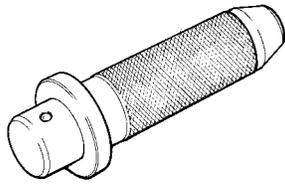
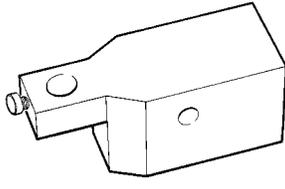
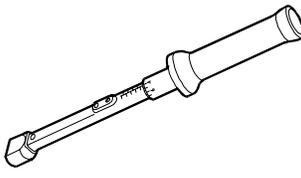
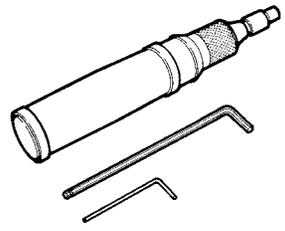
99360605

Band for fitting piston into cylinder barrel (60 – 125 mm)

99361037

Brackets for fastening engine to revolving stand 99322205

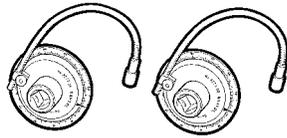
TOOLS

TOOL NO.	DESCRIPTION
99363204	 Tool to remove gaskets
99367121	 Manual pump for pressure and depression measures
99370006	 Handgrip for interchangeable beaters
99370415	 Gauge base for different measurements (to be used with 99395603)
99389829	 Dog type dynamometric wrench 9x12 (5-60 Nm)
99389834	 Torque screwdriver for injector solenoid valve connector stop nut setting

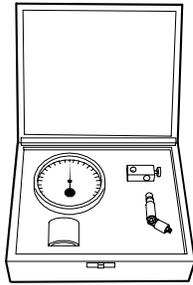
TOOLS

TOOL NO.

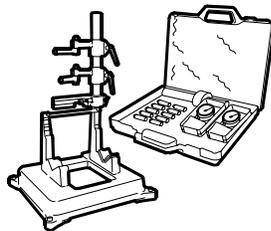
DESCRIPTION

99395216

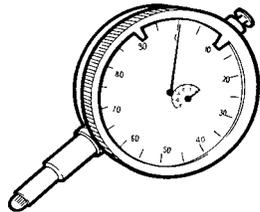
Pair of gauges with 1/2" and 3/4" square head for angle tightening

99395220

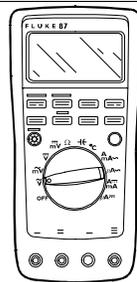
Universal goniometer/inclinometer

99395363

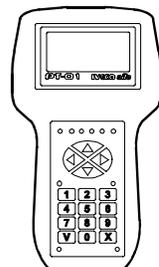
Complete bush testing square

99395603

Dial gauge (0 – 5 mm)

99395872

Analog to digital multimeter for voltage, current intensity, resistance, diodes, frequencies, capacity and registration of the minimum, average and maximum values

8093731

Tester PT01