TYPE APPROVAL CERTIFICATE

N. ELE096416CS

This is to certify that the product below is found to be in compliance with the applicable requirements of the RINA type approval system.

Description	**Electromagnetic Flow measuring system**
Type	**Proline Promag 50 H , 53 H , 50 P , 53P , 50W, 53W**
Applicant	**Endress + Hauser Italy S.p.A** **Via Fratelli Di Dio 7** **20063 Cernusco s/N (MI)** **Italy**
Manufacturer	**Endress + Hauser Flowtec AG** **Kaegenstrasse 7** **CH-4153 Reinach BL1** **Switzerland**
Testing Standard	**Rules for the Classification of Ships - Part C - Machinery, Systems and Fire protection - Ch.3, Sect.6, Tab.1.**

Issued in **Genova, June 13, 2016.**

This certificate is valid until **June 13, 2021**

Valerio Bonanni

RINA Services S.p.A.

Valerio Bonanni

TYPE APPROVAL CERTIFICATE

N. ELE096416CS

Main Features:

Measuring principle
In the electromagnetic measuring principle, the flowing medium is the moving conductor.
The voltage induced is proportional to the flow velocity and is supplied to the amplifier by means of two measuring electrodes.
The flow volume is calculated by means of the pipe cross-sectional area.
The DC magnetic field is created through a switched direct current of alternating polarity.

For measuring ranges of H P and W models see tables at pages 6-7

Application
Electromagnetic flowmeter intended for bidirectional measurement of liquid with a minimum conductivity of :
General fluid : > or = 5µS/cm
Demineralized water : > or = 20µS/cm
Measuring system:

Measuring system consist of a transmitter and a sensor.
Two version are available:
Compact version : Transmitter and sensor form a mechanical unit
Remote version: Sensor is mounted separate from the transmitter

Transmitter:
PROMAG 50 (user interface with push buttons for operation, two-line display, illuminated)
Operating T. amb -20 to 60°C Std
PROMAG 53 (user interface "Touch Control" without opening the housing, four-line display, unilluminated)
Operating T. amb -20 to 60°C Std

SENSORS

PROMAG H	PROMAG P	PROMAG W
DN 2 to 150	DN 15 to 600	DN 25 to 2000
Flow measurement up to 600 m³/h	Flow measurement up to 9600 m³/h	Flow measurement up to 110000 m³/h
Fluid temperature: up to +150 °C with seals EPDM, Viton, Silicone, Kalrez	Fluid temperature: -40 to +130 °C PTFE lining (DN15 to 600) -20 to +180 °C PFA lining (DN25 to 200)	Fluid temperature: -20 to +50°C with Polyurethane (DN25 to 1200) 0 to +80°C with hard rubber (DN50 to 2000)
Process pressures up to 40 bar	Process pressures up to 40 bar	Process pressures up to 40 bar
Degree of protection: IP 67 Std.	Degree of protection: IP 67 Std.	Degree of protection: IP 67 Std.
T amb.: -40 to +60 °C	Tamb.: -10 to +60°C Carbon Steel Flange Tamb.: -40 to +60°C Stainless Steel Flange	Tamb.: -10 to +60°C Carbon Steel Flange Tamb.: -40 to +60°C Stainless Steel Flange

Input: flow velocity (proportional to induced voltage)

Status input (auxiliary input)
• U = 3 to 30 V DC, Ri = 5 kΩ, galvanically isolated
• Configurable for: totalizer(s) reset, positive zero return, error-message reset

Status input (auxiliary input) with PROFIBUS DP and Modbus RS485
• U = 3 to 30 V DC, Ri = 3 kΩ, galvanically isolated
• Switching level: 3 to 30 V DC, independent of polarity
• Configurable for: totalizer(s) reset (Modbus RS485 only), positive zero return, error-message reset, batching start/stop (optional), batch totalizer reset (optional)

Current input (only Promag 53)
• active/passive selectable, galvanically isolated, full scale value selectable, resolution: 3 µA, temperature coefficient: typ. 0.005% o.r./°C (o.r. = of reading)
• active: 4 to 20 mA, Ri ≤ 150 Ω, max. 24 V DC, short-circuit proof
• passive: 0/4 to 20 mA, Ri < 150 Ω, max. 30 V DC

Output:

Promag 50

Current output
active/passive selectable, galvanically isolated, time constant selectable (0.01 to 100 s), full scale value selectable, temperature coefficient: typ. 0.005% o.r./°C (o.r. = of reading), resolution: 0.5 µA
- active: 0/4 to 20 mA, RL < 700 Ω (for HART: RL ≥ 250 Ω)
- passive: 4 to 20 mA; supply voltage Vs: 18 to 30 V DC; Ri ≥ 150 Ω

Pulse/frequency output
passive, open collector, 30 V DC, 250 mA, galvanically isolated
- Frequency output: full scale frequency 2 to 1000 Hz (fmax = 1250 Hz), on/off ratio 1:1,pulse width max. 10 s
- Pulse output: pulse value and pulse polarity selectable, max. pulse width configurable (0.5 to 2000 ms)

PROFIBUS DP interface
- Transmission technology (Physical Layer): RS485 in accordance with ANSI/TIA/EIA-485-A: 1998, galvanically isolated
- Profile version 3.0
- Data transmission rate: 9.6 kBaud to 12 MBaud
- Automatic data transmission rate recognition
- Function blocks: 1 × analog Input, 1 × totalizer
- Output data: volume flow, totalizer
- Input data: positive zero return (ON/OFF), totalizer control, value for local display
- Cyclic data transmission compatible with previous model Promag 33
- Bus address adjustable via miniature switches or local display (optional) at the measuring device

PROFIBUS PA interface
- Transmission technology (Physical Layer): IEC 61158-2 (MBP), galvanically isolated
- Profile version 3.0
- Current consumption: 11 mA
- Permissible supply voltage: 9 to 32 V
- Bus connection with integrated reverse polarity protection
- Error current FDE (Fault Disconnection Electronic): 0 mA
- Function blocks: 1 × analog input, 2 × totalizer
- Output data: volume flow, totalizer
- Input data: positive zero return (ON/OFF), totalizer control, value for local display
- Cyclic data transmission compatible with previous model Promag 33
- Bus address adjustable via miniature switches or local display (optional) at the measuring device

Promag 53

Current output
active/passive selectable, galvanically isolated, time constant selectable (0.01 to 100 s), full scale value selectable, temperature coefficient: typ. 0.005% o.r./°C (o.r. = of reading), resolution: 0.5 µA
- active: 0/4 to 20 mA, RL < 700 Ω (for HART: RL ≥ 250 Ω)
- passive: 4 to 20 mA; supply voltage Vs: 18 to 30 V DC; Ri ≥ 150 Ω

Pulse/frequency output
active/passive selectable, galvanically isolated (Ex i version: only passive)
- active: 24 V DC, 25 mA (max. 250 mA during 20 ms), RL > 100 Ω
- passive: open collector, 30 V DC, 250 mA
- Frequency output: full scale frequency 2 to 10000 Hz (fmax = 12500 Hz), for EEx-ia 2 to 5000 Hz; on/off ratio 1:1, pulse width max. 10 s
- Pulse output: pulse value and pulse polarity selectable, max. pulse width configurable (0.05 to 2000 ms)

PROFIBUS DP interface
• Transmission technology (Physical Layer): RS485 in accordance with ANSI/TIA/EIA-485-A: 1998, galvanically isolated
• Profile version 3.0
• Data transmission rate: 9.6 kBaud to 12 MBaud
• Automatic data transmission rate recognition
• Function blocks: 2 × analog input, 3 × totalizer
• Output data: volume flow, calculated mass flow, totalizer 1 to 3
• Input data: positive zero return (ON/OFF), totalizer control, value for local display
• Cyclic data transmission compatible with previous model Promag 33
• Bus address adjustable via miniature switches or local display (optional) at the measuring device

PROFIBUS PA interface
• Transmission technology (Physical Layer): IEC 61158-2 (MBP), galvanically isolated
• Profile version 3.0
• Current consumption: 11 mA
• Permissible supply voltage: 9 to 32 V
• Bus connection with integrated reverse polarity protection
• Error current FDE (Fault Disconnection Electronic): 0 mA
• Function blocks: 2 × analog input, 3 × totalizer
• Output data: volume flow, calculated mass flow, totalizer 1 to 3
• Input data: positive zero return (ON/OFF), totalizer control, value for local display
• Cyclic data transmission compatible with previous model Promag 33
• Bus address adjustable via miniature switches or local display (optional) at the measuring device

Modbus RS485 interface
• Transmission technology (Physical Layer): RS485 in accordance with ANSI/TIA/EIA-485-A: 1998, galvanically isolated
• Modbus device type: slave
• Address range: 1 to 247
• Bus address adjustable via miniature switches or local display (optional) at the measuring device
• Supported Modbus function codes: 03, 04, 06, 08, 16, 23
• Broadcast: supported with the function codes 06, 16, 23
• Transmission mode: RTU or ASCII
• Supported baudrate: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 Baud
• Response time:
– Direct data access = typically 25 to 50 ms
– Auto-scan buffer (data range) = typically 3 to 5 ms

FOUNDATION Fieldbus interface
• FOUNDATION Fieldbus H1
• Transmission technology (Physical Layer): IEC 61158-2 (MBP), galvanically isolated
• ITK version 5.01
• Current consumption: 12 mA
• Error current FDE (Fault Disconnection Electronic): 0 mA
• Bus connection with integrated reverse polarity protection
• Function blocks:
5 × Analog Input (execution time: 18 ms each); 1 × PID (25 ms) ; 1 × Digital Output (18 ms); 1 × Signal Characterizer (20 ms)
1 × Input Selector (20 ms); 1 × Arithmetic (20 ms) ; 1 × Integrator (18 ms)
• Output data: volume flow, calculated mass flow, totalizer 1 to 3
• Input data: positive zero return (ON/OFF), reset totalizer
• Link Master (LM) functionality is supported

Signal on alarm
Current output → failure response selectable (e.g. in accordance with NAMUR recommendation NE 43)
• Pulse/frequency output → failure response selectable
• Status output (Promag 50) → "non-conductive" by fault or power supply failure
• Relay output (Promag 53) → "de-energized" by fault or power supply failure

Low Flow Cutoff
Switch points for low flow cutoff are selectable.

Galvanic isolation
All circuits for inputs, outputs and power supply are galvanically isolated from each other.

Switching output
Status output (Promag 50, Promag 53)
Open collector, max. 30 V DC / 250 mA, galvanically isolated.
Configurable for: error messages, Empty Pipe Detection (EPD), flow direction, limit values
Relay outputs (Promag 53)
Normally closed (NC or break) or normally open (NO or make) contacts available
(factory setting: relay 1 = NO, relay 2 = NC),
max. 30 V / 0.5 A AC; 60 V / 0.1 A DC, galvanically isolated.
Configurable for: error messages, Empty Pipe Detection (EPD), flow direction, limit values, batching contacts

Supply voltage
• 85 to 260 V AC, 45 to 65 Hz
• 20 to 55 V AC, 45 to 65 Hz
• 16 to 62 V DC
PROFIBUS PA and FOUNDATION Fieldbus
• Non-Ex: 9 to 32 V DC
• Ex i: 9 to 24 V DC
• Ex d: 9 to 32 V DC

Power supply failure
Lasting at least one half cycle frequency: EEPROM saves measuring system data
• EEPROM or T-DAT (Promag 53 only) retain the measuring system data in the event of a power supply failure
• S-DAT: exchangeable data storage chip which stores the data of the sensor (nominal diameter, serial number, calibration factor, zero point etc.)

Maximum measured error

Promag 50
• Pulse output: ±0.5% o.r. ± 1 mm/s
optional: ±0.2% o.r. ± 2 mm/s (o.r. = of reading)
• Current output: also typically ± 5 µA

Promag 53
• Pulse output: ±0.2% o.r. ± 2 mm/s (o.r. = of reading)
• Current output: also typically ± 5 µA
Fluctuations in the supply voltage do not have any effect within the specified range.

Repeatability
Max. ±0.1% o.r. ± 0.5 mm/s (o.r. = of reading)

TYPE APPROVAL CERTIFICATE

N. ELE096416CS

Measuring ranges Proline Promag 50 H, 53 H ; Flow characteristics values:

Nominal diameter		Recommended flow rate	Factory setting		
mm	inch	Min. / Max full scale value (v~ 0.3 - 10m/s)	Full scale value, Current output (v~ 2.5 m/s)	Pulse value ~ 2 pulses/s	Low flow cut off (v~ 0.04 m/s)
2	1/12"	0.06 to 1.8 dm^3 /min	0.5 m^3 /min	0.005 dm^3	0.01 dm^3 /min
4	1/8"	0.25 to 7 dm^3 /min	2 m^3 /min	0.025 dm^3	0.05 dm^3 /min
8	3/8"	1 to 30 dm^3 /min	8 m^3 /min	0.1 dm^3	0.1 dm^3 /min
15	½"	4 to 100 dm^3 /min	25 m^3 /min	0.2 dm^3	0.5 dm^3 /min
25	1"	9 to 300 dm^3 /min	75 m^3 /min	0.5 dm^3	1 dm^3 /min
40	1 ½ "	25 to 700 dm^3 /min	200 m^3 /min	1.5 dm^3	3 dm^3 /min
50	2"	35 to 1100 dm^3 /min	300 m^3 /min	2.5 dm^3	5 dm^3 /min
65	-	60 to 2000 dm^3 /min	500 m^3 /min	5 dm^3	8 dm^3 /min
80	3"	90 to 3000 dm^3 /min	750 m^3 /min	5 dm^3	12 dm^3 /min
100	4"	145 to 4700 dm^3 /min	1200 m^3 /min	10 dm^3	20 dm^3 /min
125	5"	220 to 7500 dm^3 /min	1850 m^3 /min	15 dm^3	30 dm^3 /min
150	6"	20 to 600 m^3 /h	150 m^3 /h	0.03 m^3	2.5 m^3 /h

Measuring ranges Proline Promag 50 P, 53 P ; Flow characteristics values:

Nominal diameter		Recommended flow rate	Factory setting		
mm	inch	Min. / Max full scale value (v~ 0.3 - 10m/s)	Full scale value, Current output (v~ 2.5 m/s)	Pulse value ~ 2 pulses/s	Low flow cut off (v~ 0.04 m/s)
15	½"	4 to 100 dm^3 /min	25 dm^3 /min	0.20 dm^3	0.50 dm^3 /min
25	1"	9 to 300 dm^3 /min	75 dm^3 /min	0.50 dm^3	1.00 dm^3 /min
32	-	15 to 500 dm^3 /min	125 dm^3 /min	1.00 dm^3	2.00 dm^3 /min
40	1 ½"	25 to 700 dm^3 /min	200 dm^3 /min	1.50 dm^3	3.00 dm^3 /min
50	2"	35 to 1100 dm^3 /min	300 dm^3 /min	2.50 dm^3	5.00 dm^3 /min
65	-	60 to 2000 dm^3 /min	500 dm^3 /min	5.00 dm^3	8.00 dm^3 /min
80	3"	90 to 3000 dm^3 /min	750 dm^3 /min	5.00 dm^3	12.0 dm^3 /min
100	4"	145 to 4700 dm^3 /min	1200 dm^3 /min	10.0 dm^3	20.0 dm^3 /min
125	-	220 to 7500 dm^3 /min	1850 dm^3 /min	15.0 dm^3	30.0 dm^3 /min
150	6"	20 to 600 m^3 /h	150 m^3 /h	0.03 m^3	2.50 m^3 /h
200	8"	35 to 1100 m^3 /h	300 m^3 /h	0.05 m^3	5.00 m^3 /h
250	10"	55 to 1700 m^3 /h	500 m^3 /h	0.05 m^3	7.50 m^3 /h
300	12"	80 to 2400 m^3 /h	750 m^3 /h	0.10 m^3	10.0 m^3 /h
350	14"	110 to 3300 m^3 /h	1000 m^3 /h	0.10 m^3	15.0 m^3 /h
400	16"	140 to 4200 m^3 /h	1200 m^3 /h	0.15 m^3	20.0 m^3 /h
450	18"	180 to 5400 m^3 /h	1500 m^3 /h	0.25 m^3	25.0 m^3 /h
500	20"	220 to 6600 m^3 /h	2000 m^3 /h	0.25 m^3	30.0 m^3 /h
600	24"	310 to 9600 m^3 /h	2500 m^3 /h	0.30 m^3	40.0 m^3 /h

TYPE APPROVAL CERTIFICATE

N. ELE096416CS

Measuring ranges Proline Promag 50 W, 53 W _ Flow characteristics values:

Nominal diameter		Recommended flow rate	Factory setting		
mm	inch	Min. / Max full scale value (v~ 0.3 - 10m/s)	Full scale value, Current output (v~ 2.5 m/s)	Pulse value ~ 2 pulses/s	Low flow cut off (v~ 0.04 m/s)
25	1"	9 to 300 dm^3 /min	75 dm^3 /min	0.5 dm^3	1 dm^3 /min
32	-	15 to 500 dm^3 /min	125 dm^3 /min	1.00 dm^3	2 dm^3 /min
40	1 ½"	25 to 700 dm^3 /min	200 dm^3 /min	1.50 dm^3	3 dm^3 /min
50	2"	35 to 1100 dm^3 /min	300 dm^3 /min	2.50 dm^3	5 dm^3 /min
65	-	60 to 2000 dm^3 /min	500 dm^3 /min	5.00 dm^3	8 dm^3 /min
80	3"	90 to 3000 dm^3 /min	750 dm^3 /min	5.00 dm^3	12 dm^3 /min
100	4"	145 to 4700 dm^3 /min	1200 dm^3 /min	10.00 dm^3	20 dm^3 /min
125	-	220 to 7500 dm^3 /min	1850 dm^3 /min	15.00 dm^3	30 dm^3 /min
150	6"	20 to 600 m^3 /h	150 m^3 /h	0.025 m^3	2.5 m^3 /h
200	8"	35 to 1100 m^3 /h	300 m^3 /h	0.05 m^3	5.0 m^3 /h
250	10"	55 to 1700 m^3 /h	500 m^3 /h	0.05 m^3	7.5 m^3 /h
300	12"	80 to 2400 m^3 /h	750 m^3 /h	0.10 m^3	10 m^3 /h
350	14	110 to 3300 m^3 /h	1000 m^3 /h	0.10 m^3	15 m^3 /h
375	15"	140 to 4200 m^3 /h	1200 m^3 /h	0.15 m^3	20 m^3 /h
400	16"	140 to 4200 m^3 /h	1200 m^3 /h	0.15 m^3	20 m^3 /h
450	18"	180 to 5400 m^3 /h	1500 m^3 /h	0.25 m^3	25 m^3 /h
500	20"	220 to 6600 m^3 /h	2000 m^3 /h	0.25 m^3	30 m^3 /h
600	24"	310 to 9600 m^3 /h	2500 m^3 /h	0.30 m^3	40 m^3 /h
700	28"	420 to 13500 m^3 /h	3500 m^3 /h	0.50 m^3	50 m^3 /h
-	30"	480 to 15000 m^3 /h	4000 m^3 /h	0.50 m^3	60 m^3 /h
800	32"	550 to 18000 m^3 /h	4500 m^3 /h	0.75 m^3	75 m^3 /h
900	36"	690 to 22500 m^3 /h	6000 m^3 /h	0.75 m^3	100 m^3 /h
1000	40"	850 to 28000 m^3 /h	7000 m^3 /h	1.00 m^3	125 m^3 /h
-	42"	950 to 30000 m^3 /h	8000 m^3 /h	1.00 m^3	125 m^3 /h
1200	48"	1250 to 40000 m^3 /h	10000 m^3 /h	1.50 m^3	150 m^3 /h
-	54"	1550 to 50000 m^3 /h	13000 m^3 /h	1.50 m^3	200 m^3 /h
1400	-	1700 to 55000 m^3 /h	14000 m^3 /h	2.00 m^3	225 m^3 /h
-	60"	1950 to 60000 m^3 /h	16000 m^3 /h	2.00 m^3	250 m^3 /h
1600	-	2200 to 70000 m^3 /h	18000 m^3 /h	2.50 m^3	300 m^3 /h
-	66"	2500 to 80000 m^3 /h	20500 m^3 /h	2.50 m^3	325 m^3 /h
1800	72"	2800 to 90000 m^3 /h	23000 m^3 /h	3.00 m^3	350 m^3 /h
-	78"	3300 to 100000 m^3 /h	28500 m^3 /h	3.50 m^3	450 m^3 /h
2000	-	3400 to 110000 m^3 /h	28500 m^3 /h	3.50 m^3	450 m^3 /h

Equipment and protective systems intended for use in potentially explosive atmospheres – Directive 94/9/EC

Model :	**Flow Measuring system type PROMAG 5****-**************
Certification Authority :	DEKRA EXAM GmbH
EC-Type Examination Certificate:	DMT 00 ATEX E 017X

Safety standard complied with:

EN 60079-0: 2012 + A11:2013	General requirements
EN 60079-1:2007	Flameproof enclosure "d"
EN 60079-7:2007	Increased safety "e"
EN 60079-11:2012	Intrinsic safety "i"
EN 60079-31:2014	Protection by enclosures "t"

Marking:

For Transmitter	II 2(1) G Ex de [ia Ga] IIC/IIB T6…T1 Gb	II 2D Ex tb IIIC t**°cDb
For Sensor	II 2G Ex e [ia] IIC T6… T1 Gb	II 2D Ex tb IIIC T**°C Db

TYPE APPROVAL CERTIFICATE

N. ELE096416CS

Type designation: PROMAG 5 abcc-defghiklmnop##**

a: by the transmitter versions 0, 1 or 3

b: by the letter H, P, or W

cc: by a combination of two letters and / or numbers to indicate the nominal diameter range of nominal diameter for sensor type H: DN2 up to DN150 and for sensor type P/W:DN15 up to DN3000 or XX for transmitter only

d: for sensor type H: by a letter indicating the process connection and its material
for sensor type P and W: by a letter indicating the liner material

A	for PFA
E, 1, 2	for PTFE
C, D, F, G, H, S	for hard rubber
U, L, M, R, P	for polyurethane
Any number or letter	for liner in high pressure construction
X	for transmitter only

e for sensor type P and W: by a letter or number indicating the material for the process connection
for sensor type H: by a letter or number indicating the material for the flange sealing

f by a letter or number indicating the material for the electrodes

g by a letter or number indicating the method of calibration

h by a letter or number to indicate certification (others than explosion protection) of the apparatus

i by approval

B, 3, 5, U	for EX de [ia] (terminal compartment in type of protection Ex d)
D, 4, 6	for EX de [ia] (terminal compartment in type of protection Ex e)

k by the version

A	for the compact version IP 67
G	for the remote version IP 67
N	for the remote IP 68
P	for the compact version IP 67 for enhanced climate conditions
T	for the remote version IP 67 for enhanced climate conditions
U	for the compact version IP 67 stainless steel
V	for the compact version IP 67, stainless steel for Ta= -40°C
W	for the remote version IP67, stainless steel
6	for the compact version IP 67 for Ta = - 40°C
7	for the remote version IP67 for Ta= - 40°C
8	for the remote version IP 68 for Ta= - 40°C

l for the remote version: by a letter or number to indicate the cable

m by a letter or number to indicate the thread form of the cable entries

n by a letter or number to indicate the voltage of the power supply and variants of the display
A, C, E, G, P, R, T, 0, 2, 4 and 7 for AC 85 up to 260 V
B, D, F, H, Q, S, U, 1 , 3, 5 and 8 for AC 20 up to 55V or DC 16 up to 62V
X for, sensor only

o by a letter or number indicating different software versions

p by the in / outputs of the transmitter electronics
A,B,C,D,E,H,J,K,L,N,P,Q,V,W,0,1,2,3,4,5,6,7,8 and 9 for non intrinsically safe output

F	for Profibus PA , Ex ia
G	for Foundation Fieldbus , Ex ia
R	for Current Hart (active) , Ex ia
S	for Current-Hart (active) , Frequency, Ex ia
T	for Current-Hart (Passive), Frequency, Ex ia
U	for Current-Hart (passive) , Ex ia

"**" additional digits (none, two or multiple of two numbers and/ or letters) indicating options which are not relevant for type of explosion protection. These digits are indicated by signs like # + =

TYPE APPROVAL CERTIFICATE

N. ELE096416CS

Technical information:
TI00048D/06/EN/13.12 ; TI047D/06/EN/11.09; TI046D/24/EN/07.10

Test reports:
Hanse Controlcert doc. n. 10-L-01731-01 ; 10-L-01732-01 ; 10-L-01733-01;
Paconsult doc. n. 10-3016 (23/08/2010)

General remarks:

Safety parameters to be in accordance with EC- type Examination certificate DMT 00 ATEX E 017X

Installation and use to be in accordance with the manufacturer instructions.

For each equipment, before delivery on board, accuracy test Certificate to be provided , based on accredited calibration rigs that are traced to ISO 17025.