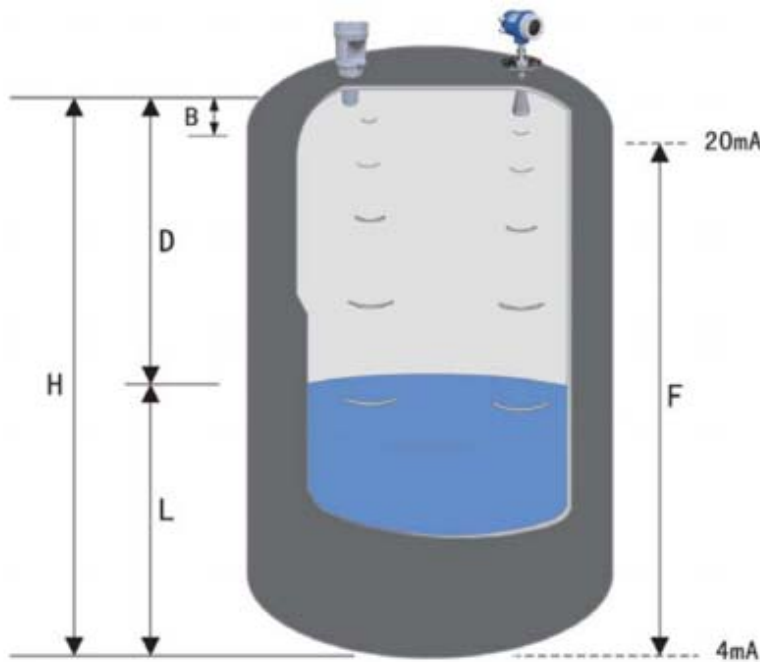


HGUL Ultrasonic Level Transmitter

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Principle



Note for symbol in left picture:

- B: Blind area
- D: Empty distance
- L: Material level
- H: Installation height
- F: Full scale of material level

$L=H-D$

The sensor of the meter pulses in the direction of the product surface. There, they are reflected back and received by the sensor. The meter measures the time t between pulse transmission and reception. The meter uses the time t (and the velocity of sound c) to calculate the distance D between the sensor membrane and the product surface: $D=C \times t/2$
As the device knows the installation height H from a user entry, it can calculate the level as follows:

$L=H-D$

An integrated temperature sensor compensates for changes in the velocity of sound caused by temperature changes.


Integrate type Ultrasonic level meter technical parameters

1. Technical parameters for 2-wires series



Range (meter)	0.2-4, 0.25-6, 0.3-8, 0.4-10, 0.6-15, 1.2-20, 1.4-30, 1.6-40	0.2-4, 0.25-6, 0.3-8, 0.4-10, 0.6-15, 1.2-20, 1.4-30, 1.6-40	0.2-4, 0.4-4, 0.3-8, 0.45-8
Accuracy (in the air)	0.2%FS	0.2%FS	0.2%FS
Current output	4-20mA	4-20mA	4-20mA
Output load	0-500Ω	0-500Ω	0-600Ω
Display	LCD 4-digit	LCD 4-digit	LCD 4-digit
Power supply	DC20-32V ≥30mA	DC20-32V ≥30mA	DC21-27V ≥35mA
Temperature	Whole-range compensation	Whole-range compensation	Whole-range

Compensation			compensation
Media Temp.	-45°C~85°C	-45°C~85°C	-20°C~75°C
Pressure range	±0.1Mpa	±0.1Mpa	±0.1Mpa
Beam Angle	8°, 5°(3db)	8°, 5°(3db)	8°(3db)
Measure cycle	1 second	1 second	1~20 seconds
Parameter set	3 buttons	3 buttons	3 buttons
Cable fix	PG 13.5 sleeve	PG 13.5 sleeve	PG 13.5 sleeve
Housing material	ABS	Die cast aluminum	cast aluminum with spray plastics
Sensor material	PVC or PTFE	PVC or PTFE	PVC or PTFE with metal sleeve
Protect grade	IP67	IP67	IP67
Explosion-proof	NA	NA	Ex(ia) IICT6
Mounting	Thread, Flanged, or Bracket	Thread, Flanged, or Bracket	Thread, Flanged



2. Technical parameters for 3-wires series

	
Range (meter)	0.2-4, 0.25-6, 0.3-8, 0.4-12, 0.6-15, 1.2-20, 1.4-30, 1.6-40
Accuracy (in the air)	0.2%FS
Current output	4-20mA
Output load	0-500Ω
Display	LCD 4-digit
Power supply	DC20-32V ≥60mA
Temperature compensation	Whole-range compensation
Media Temp.	-45°C~85°C
Pressure range	±0.1Mpa
Beam Angle	8°, 5°(3db)
Measure cycle	1 second
Parameter settings	3 buttons
Cable fix	PG 13.5 sleeve
Housing material	Die cast aluminum
Sensor material	PVC or PTFE
Protect grade	IP67
Explosion-proof	NA
Mounting	Thread, Flanged, or Bracket

3. Technical parameters for 4-wires series

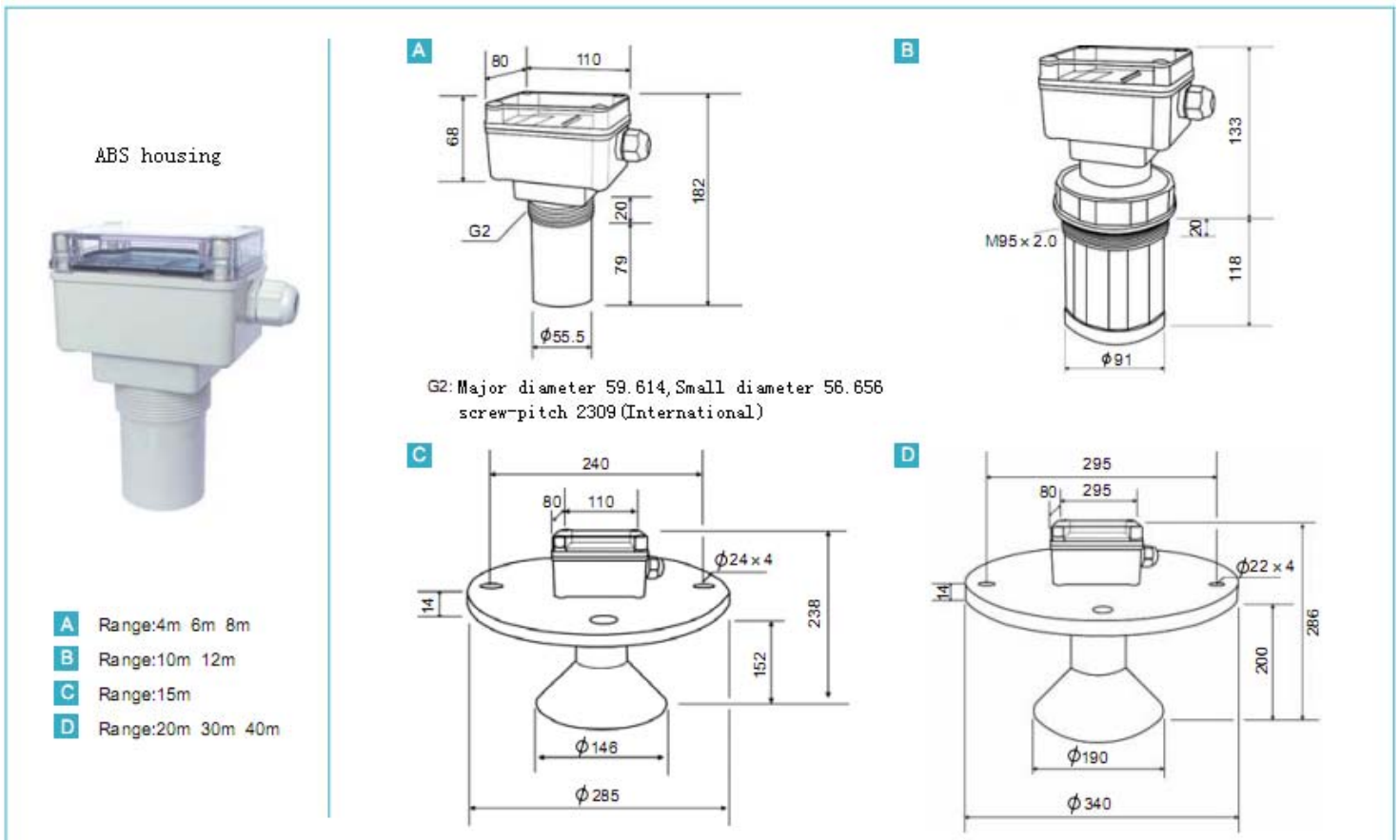
		
Range (meter)	0.2-4, 0.25-6, 0.3-8, 0.4-12, 0.6-15, 1.2-20, 1.4-30, 1.6-40	0.2-4, 0.25-6, 0.3-8, 0.4-12, 0.6-15, 1.2-20, 1.4-30, 1.6-40
Accuracy (in the air)	0.2%FS	0.2%FS
Current output	4-20mA (optional: with Hart protocol)	4-20mA (optional: with Hart protocol)
Output load	0-500Ω	0-500Ω
Relay output	Up-limit and low-limit (total 2 relay output normally open contact)	Up-limit and low-limit (total 2 relay output normally open contact)
Relay Spec.	5A 250VAC / 30VDC	5A 250VAC / 30VDC
Display	LCD 4-digit	LCD 4-digit
Power supply	DC20-32V ≥60mA or AC85-265V ≥50mA	DC20-32V ≥60mA or AC85-265V ≥50mA
Temperature compensation	Whole-range compensation	Whole-range compensation
Media Temp.	-45℃~85℃	-45℃~85℃
Pressure range	±0.1Mpa	±0.1Mpa
Beam Angle	8°, 5°(3db)	8°, 5°(3db)
Measure cycle	1 second	1 second
Parameter set	3 buttons	3 buttons
Cable fix	PG 13.5 sleeve	PG 13.5 sleeve
Housing material	ABS	Die cast aluminum
Sensor material	PVC or PTFE	PVC or PTFE
Protect grade	IP67	IP67
Explosion-proof	NA	NA
Mounting	Thread, Flanged, or Bracket	Thread, Flanged, or Bracket

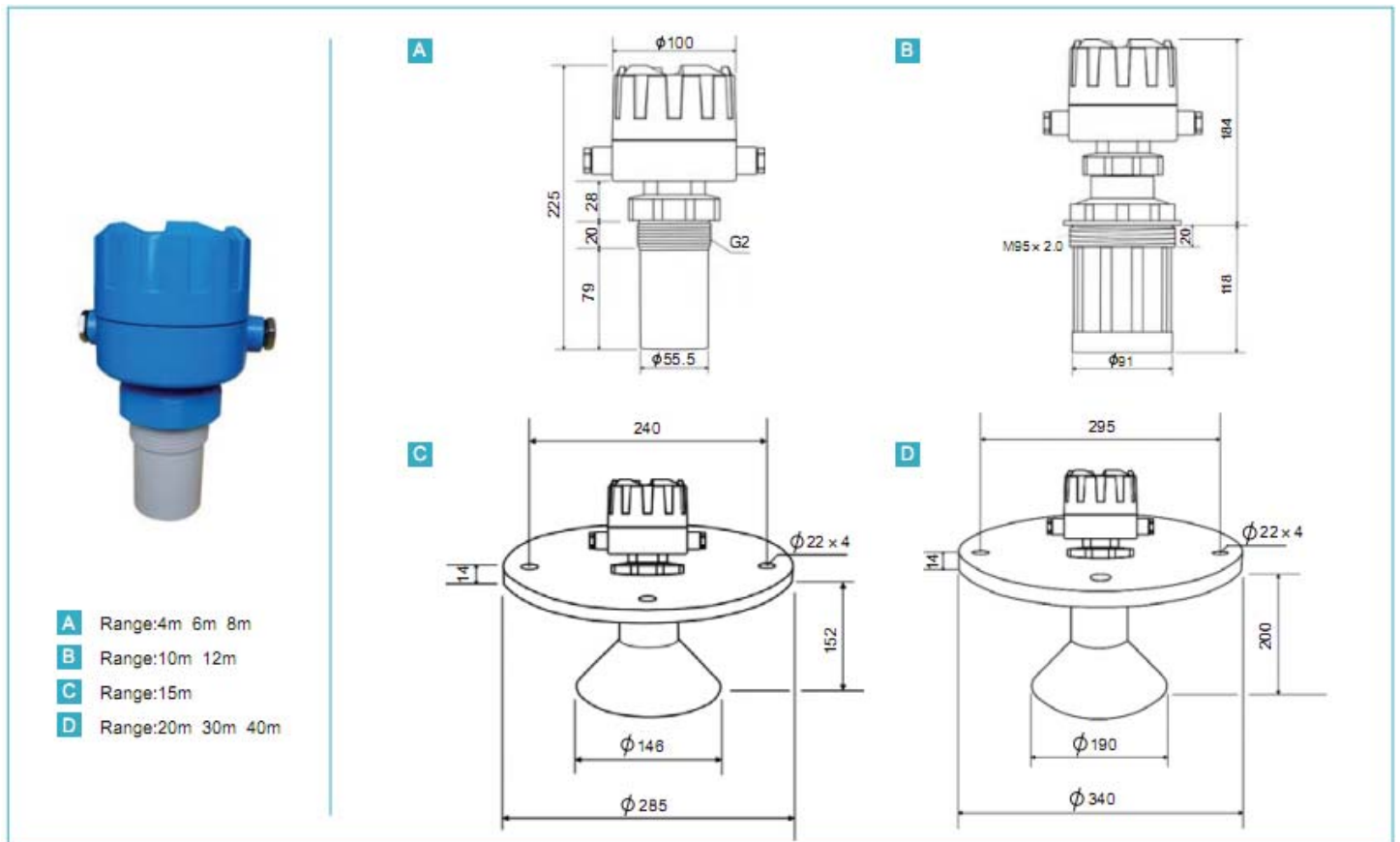
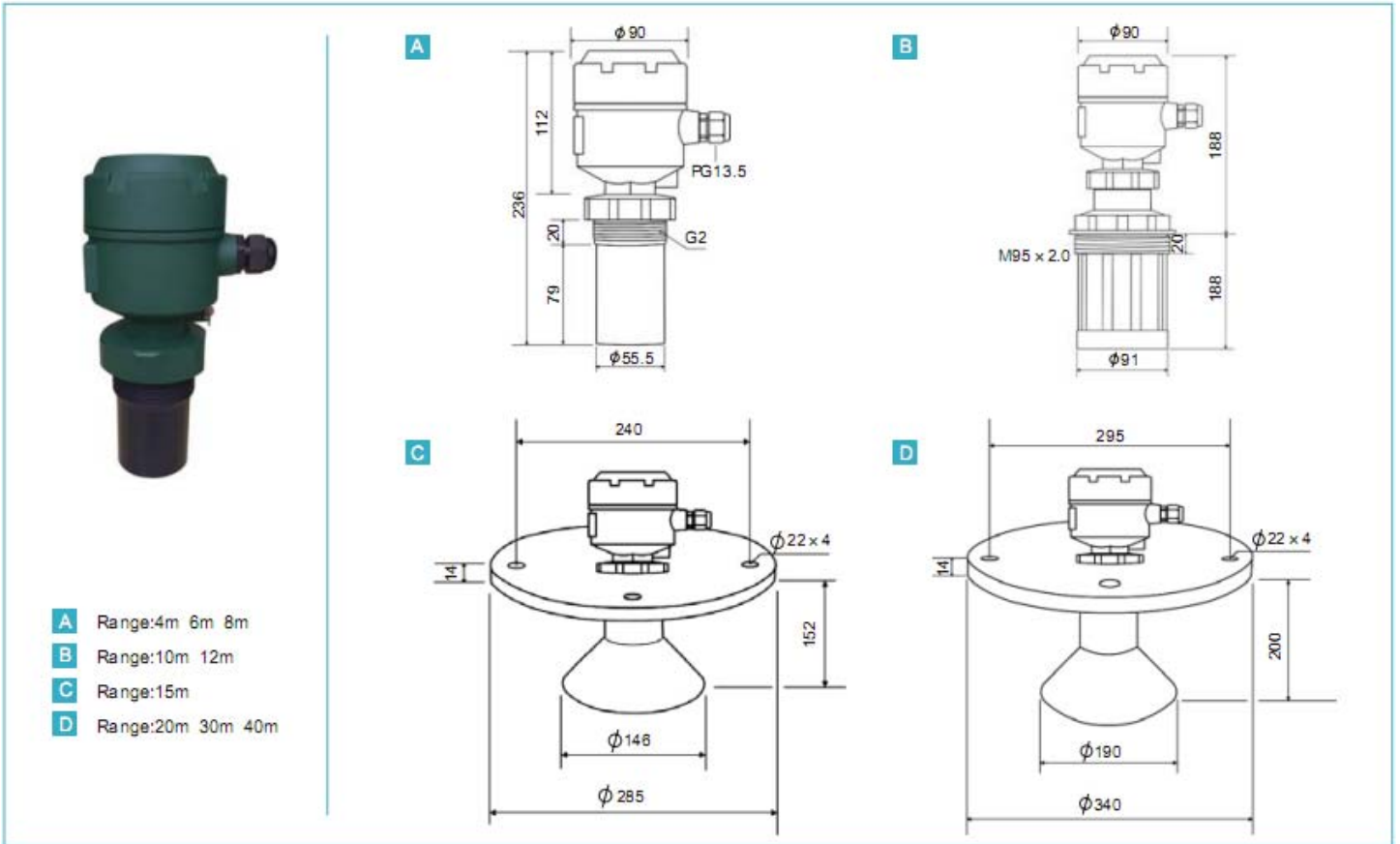
4. Technical parameters for communication series

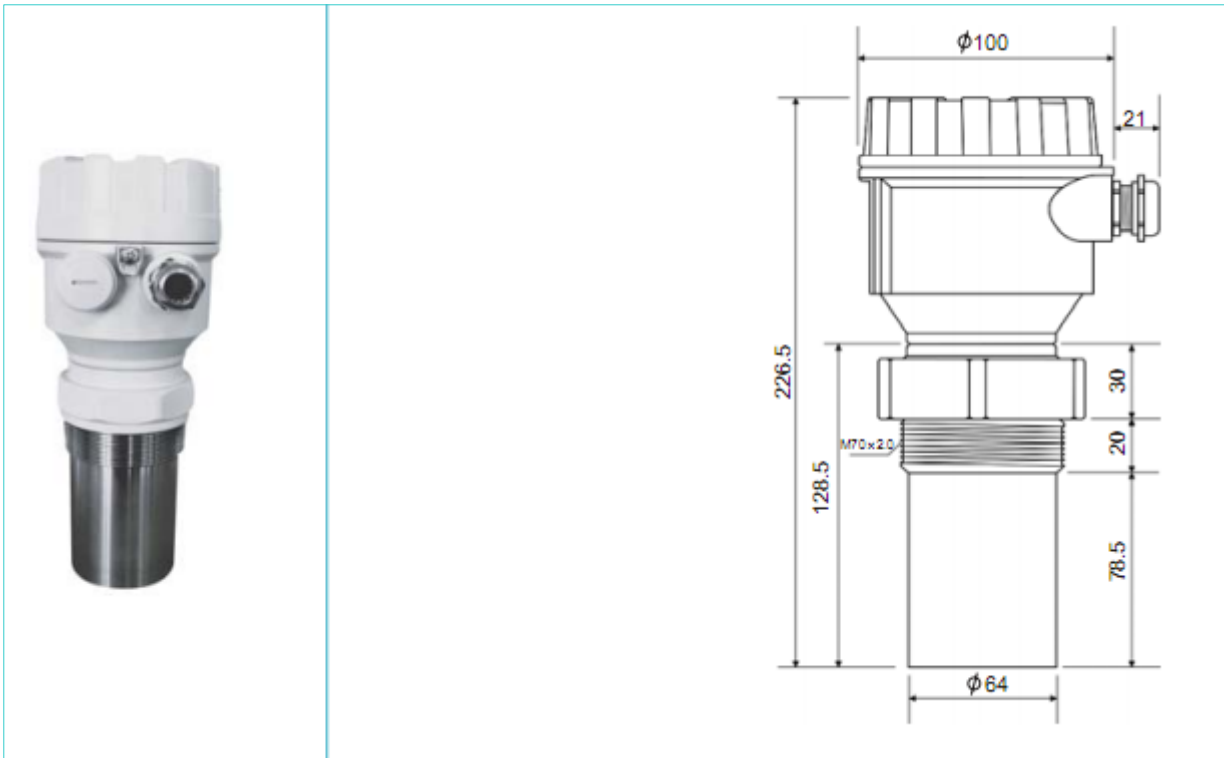
		
Range (meter)	0.2-4, 0.25-6, 0.3-8, 0.4-10, 0.6-15, 1.2-20, 1.4-30, 1.6-40	0.2-4, 0.25-6, 0.3-8, 0.4-10, 0.6-15, 1.2-20, 1.4-30, 1.6-40
Accuracy (in the air)	0.2%FS	0.2%FS
Current output	4-20mA	4-20mA
Output load	0-500Ω	0-500Ω
Communication	RS485 (Modbus protocol)	RS485 (Modbus protocol)
Baud rate	19200 / 9600 / 4800	19200 / 9600 / 4800

Display	LCD 4-digit	LCD 4-digit
Power supply	DC20-32V ≥60mA	DC20-32V ≥60mA
Temperature compensation	Whole-range compensation	Whole-range compensation
Media Temp.	-45℃~85℃	-45℃~85℃
Pressure range	±0.1Mpa	±0.1Mpa
Beam Angle	8°, 5°(3db)	8°, 5°(3db)
Measure cycle	1 second	1 second
Parameter set	3 buttons	3 buttons
Cable fix	PG 13.5 sleeve	PG 13.5 sleeve
Housing material	ABS	Die cast aluminum
Sensor material	PVC or PTFE	PVC or PTFE
Protect grade	IP67	IP67
Explosion-proof	NA	NA
Mounting	Thread, Flanged, or Bracket	Thread, Flanged, or Bracket

5. Dimension of integrate type Ultrasonic level meter











Remote type Ultrasonic level meter technical parameters

1. Main unit

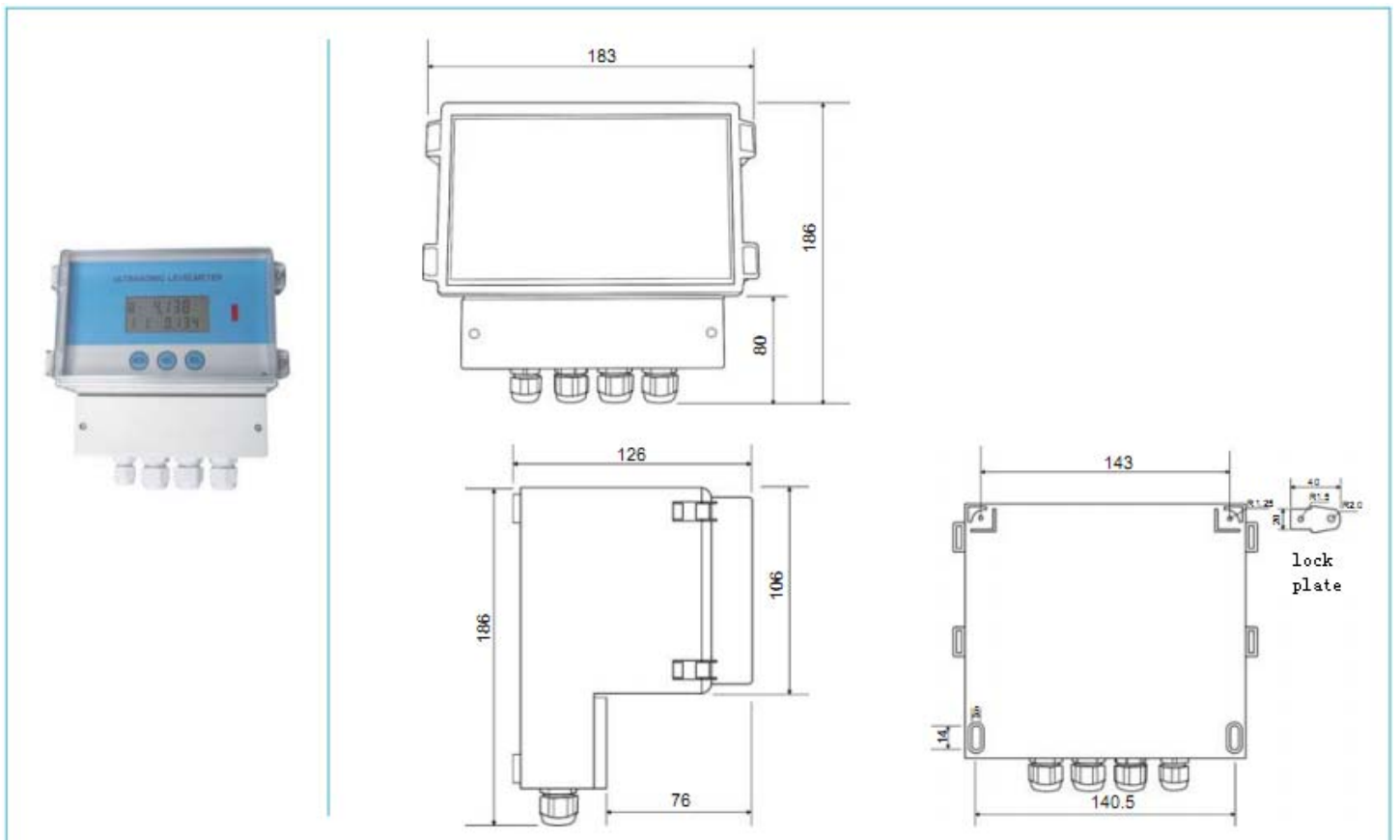
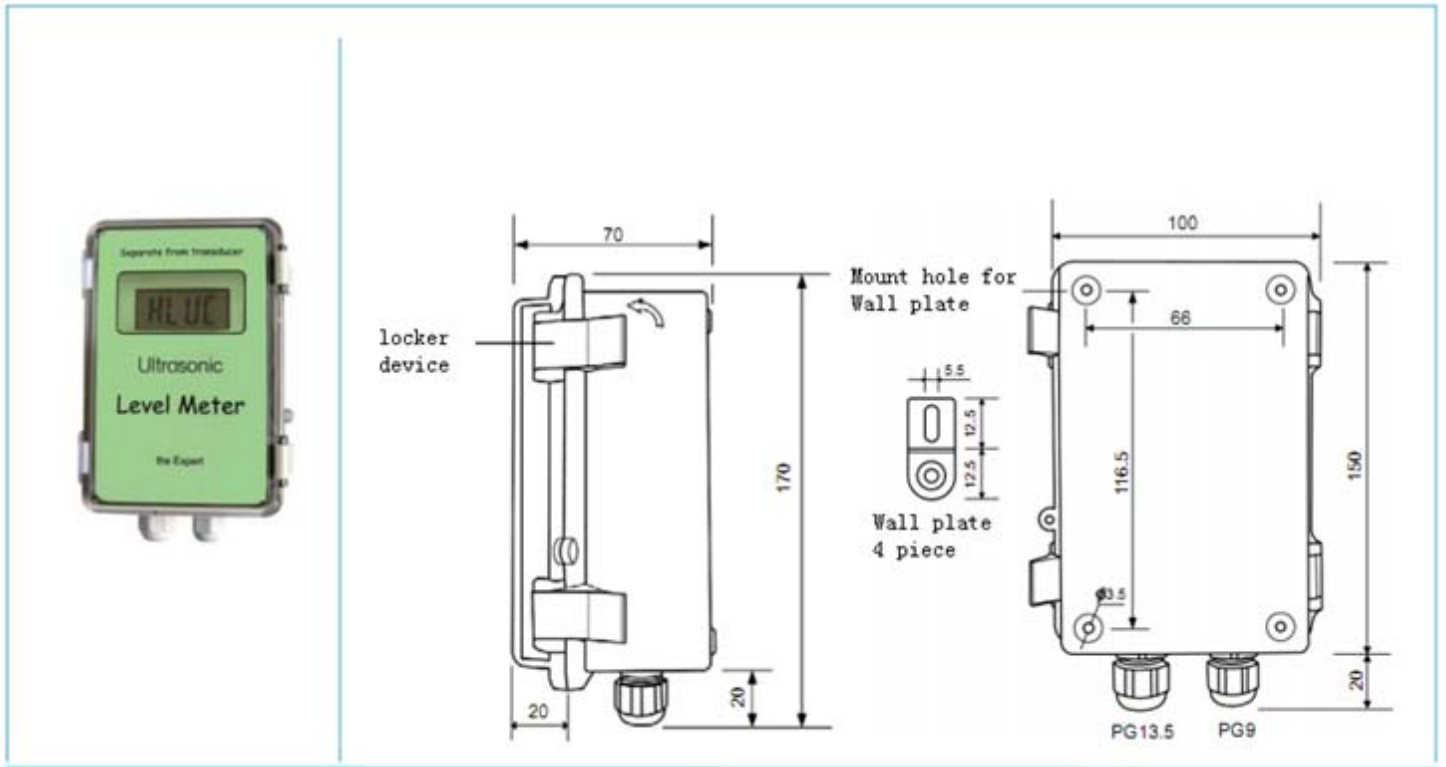
	Standard main unit	Enhanced main unit	Liquid level Difference main unit
			
Accuracy (in the air)	0.2%FS	0.2%FS	0.2%FS
Current output	4-20mA	4-20mA	Dual output 4-20mA or one output 4-20mA, another is RS485
Output load	0-500Ω	0-500Ω	0-500Ω
Display	LCD 4-digit	LCD double row, 14-digit With back light	LCD double row, 14-digit With back light

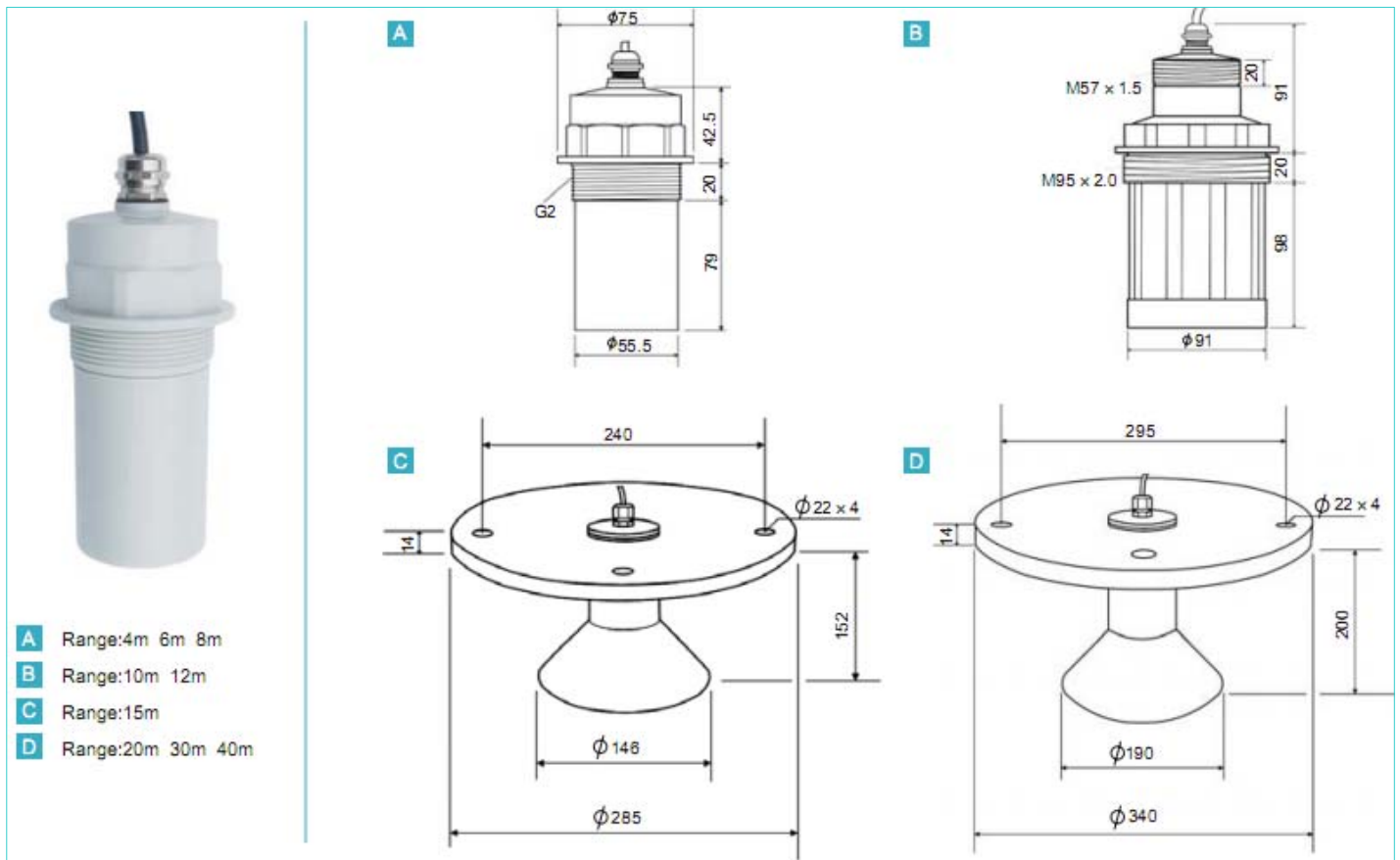
Relay output	Up-limit, low-limit alarm	Up-limit, low-limit alarm	Up-limit, low-limit alarm to control level difference
Failure alarm			Level detect failure alarm Relay output
Relay Spec.	5A 250VAC / 30VDC	5A 250VAC / 30VDC	5A 250VAC / 30VDC
Relay mode	NO.	NO. NC. can be set	NO.
Relay QTY.	2	2 / 4 / 6	3
Communication	RS485 (Modbus protocol)	RS485 (Modbus protocol)	RS485 (Modbus protocol)
Baud rate	19200 / 9600 / 4800	19200 / 9600 / 4800	19200 / 9600 / 4800
Power supply	DC24V 0.1A AC85-265V ≥50mA	DC24V 0.1A AC85-265V ≥50mA	DC24V 0.1A AC220V 0.1A
Ambient Temp.	-40℃~75℃	-40℃~75℃	-40℃~75℃
Size	170 x 100 x 70mm		
Measure cycle	1 second	1 second	1 seconds
Parameter set	3 buttons	3 buttons	3 buttons
Cable fix	PG11 / PG13.5 sleeve	PG9/ PG11/PG13.5 sleeve	PG9/ PG11/PG13.5 sleeve
Housing material	ABS	ABS	ABS
Protect grade	IP67	IP67	IP67
Mounting	Wall-installed	Wall-installed	Wall-installed

2. Ultrasonic sensor

	
Range (meter)	0.2-4, 0.25-6, 0.3-8, 0.45-12, 0.6-15, 0.8-20, 1.4-30, 1.6-40
Media Temp.	-40℃~85℃
Pressure range	±0.1Mpa
Beam Angle	8°, 5°(3db)
Housing material	ABS / PVC / PTFE
Protect grade	IP68
Anti-corrosion ability	Can resist strong corrosion
Cable length	Standard 10m (can lengthen to 1000m)
Mounting	Thread / Flanged

3. Dimension of Remote type Ultrasonic level meter





Model Selection

1. Type code

HGUL-T	Integrate type 2-wire series
HGUL-N	Integrate type 3-wire series
HGUL-R	Integrate type with RS485 communication
HGUL-U	Integrate type 4-wire series
HGUL-TI	Integrate type 2-wire series explosion proof Ex(ia) IICT6
HGUL-F	Remote type standard
HGUL-M	Remote type enhanced
HGUL-G	Remote type Difference-level meter

2. Range code

04	0-4m
06	0-6m
08	0-8m

10	0-10m
12	0-12m
15	0-15m
20	0-20m
30	0-30m
40	0-40m

3. Transmitter housing material code (for integrate type)

P	Plastic ABS
G	Cast aluminum alloy green color
B	Cast aluminum alloy blue color

4. Ultrasonic sensor material code

S	Plastic ABS / PVC
F	PTFE
Q	Other

5. Process connection code

1	Thread connection G 1-1/2
2	Thread connection G 2
3	Flanged connection DN50
4	Flanged connection DN65
5	Flanged connection DN80
6	Flanged connection DN100
7	Flanged connection DN150
8	Flanged connection DN200

6. Output code

C0	4-20mA
C2	RS485 Modbus protocol
C3	HART

7. Relay QTY code

2	2 relays SPDT
4	4 relays SPDT
6	6 relays SPDT

8. Power supply code

D	DC 24V
A	AC 220V