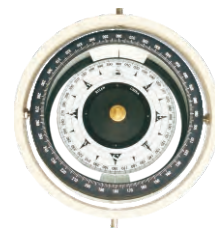




## CGF-180 Reflector Magnetic Compass

Our company has developed entirely reflector magnetic compass. The product has the advantages of beautiful outline, clear and bright reflector dial, its performance are completely in accordance with the ISO 449 and IMO standard and requirement related to navigation equipment. The magnetic compass adopts new generational directional alnico and correctional alnico, it can raise the precision of magnetic compass and transducer by a large margin .



### Main technical parameters

Project	Data
Dial Diameter	Φ180mm
Dial graduation	0° ~ 360° 1° for each grid
Using temperature	-25°C ~ +60°C
Indicating deviation (H=35 μ T, T=20 ± 3°C)	≤ 0.5°
Half period (H=35 μ T, T=20 ± 3°C)	≥ 8.62 S
Friction deviation (H=35 μ T, T=20 ± 3°C)	≤ 0.09°
Main semicircle self heterodyne correcting energy	1° ~ 45°
Secondary semicircle self heterodyne correcting energy	1° ~ 6° (magnetic inclination Q=45° )
Quadrant self heterodyne correcting energy	0.5° ~ 10°
Inclining self heterodyne correcting energy	- 75 ~ + 75 μ T
Lens barrel flexing range	± 100mm
Dial image expanding rate	≈ 2times ( original dial graduation )
Lighting power supply	AC 220V, DC 24V
Outline Dimension	750 × 500 × 1380mm ( Excluding the length of lens barrel )
Diameter of mounting holes	Pitchrow 442 Aperture Φ 24
weight	82kg

## Type CGT-165 Projection Magnetic Compass

CGT-165 Projection Magnetic Compass is a sort of vertical liquid magnetic compass with excellent performance and reliable working. It is designed and manufactured in accordance with the national standard GB/T 14108-2011 (General Technical Terms of Marine Magnetic Compass Class A) and completely accord with the demand and standard of the relevant navigation equipment regulated by ISO449 and IMO. The product has the characteristics of high precision and steady performance and can be used for long time under inclement weather at ship sailing. It has the following characteristics:

- 1、 It is the standard magnetic compass as well as concurrently acting as steering magnetic compass and overcome the difficulties that the wheelhouse is lack of area for mounting and it is difficult correcting in the steel cabin. It is useful for the arrangement of console.
- 2、 The projective tube is changed directly inserting in the bottom of the wheelhouse . The advantages of it are simple installation, convenient maintenance and may disassemble the clean imaging glass at any moment.



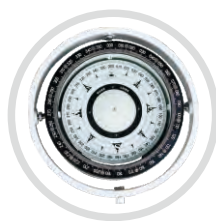
### Main technical parameters

Project	Data
Dial Diameter	Φ165mm
Dial graduation	0° ~ 360° 1° for each grid
Using temperature	-25℃~+60℃
Indicating deviation (H=35 μ T, T=20 ± 3℃)	≤0.5°
Half period (H=35 μ T, T=20 ± 3℃)	≥8.62 S
Friction deviation (H=35 μ T, T=20 ± 3℃)	≤0.09°
Main semicircle self heterodyne correcting energy	1° ~ 45°
Secondary semicircle self heterodyne correcting energy	1° ~ 6° (magnetic inclination Q=45° )
Quadrant self heterodyne correcting energy	0.5° ~ 10°
Inclining self heterodyne correcting energy	- 75 ~ + 75 μ T
Lens barrel flexing range	± 10mm
Dial image expanding rate	≈ 2times ( original dial graduation )
Lighting power supply	AC 220V, DC 24V
Outline Dimension	720 × 430 × 1300mm ( Excluding the length of lens barrel )
Diameter of mounting holes	Pitchrow 420 Aperture Φ16
weight	70kg



## Type CPL-190 Vertical Magnetic Compass

CPL-190 vertical Magnetic Compass is a sort of class A transparent liquid magnetic compass. It is designed and manufactured in accordance with the national standard GB/T 14108-2011 (General Technical Terms of Marine Magnetic Compass Class A). The magnetic compass is suitable for the large and middle vessels acting as standard compass or steering compass and is used for measuring azimuth and indicating course heading. The product has the advantages of high precision, convenient correcting difference, steady performance and legible lighting etc.



### Main technical parameters

Project	Data
Dial Diameter	Φ190mm
Dial graduation	0° ~ 360° 1° for each grid
Using temperature	-25℃ ~ +60℃
Indicating deviation (H=35 μT, T=20 ± 3℃)	≤ 0.5°
Half period (H=35 μT, T=20 ± 3℃)	≥ 8.62 S
Friction deviation (H=35 μT, T=20 ± 3℃)	≤ 0.09°
Main semicircle self heterodyne correcting energy	1° ~ 45°
Secondary semicircle self heterodyne correcting energy	1° ~ 6° (magnetic inclination Q=45°)
Quadrant self heterodyne correcting energy	0.5° ~ 10°
Inclining self heterodyne correcting energy	- 75 ~ + 75 μT
Lighting power supply	AC 220V, DC 24V
Outline Dimension	720 × 430 × 1300mm
Diameter of mounting holes	Pitchrow 420 Aperture Φ16
weight	40kg

## Type CPT-190 Table Model Magnetic Compass

CPT-190 Magnetic Compass is a sort of table model liquid magnetic compass. It is used for the middle and small vessels acting as steering compass. The compass is a magnetic compass class A and it is designed and manufactured on the basis of the national standard GB/T 14108-2011 (General Technical Terms of Marine Magnetic Compass Class A), its technical performance index are completely in accordance with the national standard. The product has the advantages of beautiful outline、high precision、convenient correcting difference、steady performance and legible lighting etc. It is the essential navigation instrument for the middle and small vessels.



### Main technical parameters

Project	Data
Dial Diameter	Φ190mm
Dial graduation	0° ~ 360° 1° for each grid
Using temperature	-25°C~60°C
Indicating deviation (H=35 μ T, T=20 ± 3°C)	≤0.5°
Half period (H=35 μ T, T=20 ± 3°C)	≥8.62 S
Friction deviation (H=35 μ T, T=20 ± 3°C)	≤0.09°
Main semicircle self heterodyne correcting energy	1° ~ 45°
Quadrant self heterodyne correcting energy	0.5° ~ 10°
Inclining self heterodyne correcting energy	- 75 ~ + 75 μ T
Lighting power supply	AC 220V, DC 24V
Outline Dimension	750 × 346 × 570mm
Diameter of mounting holes	Pitchrow 275 ApertureΦ12
weight	27kg



## Type CPL-165 Vertical Magnetic Compass

CPL-165 vertical Magnetic Compass is a sort of class A transparent liquid magnetic compass. It is designed and manufactured in accordance with the national standard GB/T 14108-2011 (General Technical Terms of Marine Magnetic Compass Class A). The magnetic compass is suitable for the large and middle vessels acting as standard compass or steering compass and is used for measuring azimuth and indicating course heading. The product has the advantages of high precision, convenient correcting difference, steady performance and legible lighting etc.



### Main technical parameters

Project	Data
Dial Diameter	Φ 165mm
Dial graduation	0° ~ 360° 1° for each grid
Using temperature	-25℃ ~ +60℃
Indicating deviation (H=35 μ T, T=20 ± 3℃)	≤ 0.5°
Half period (H=35 μ T, T=20 ± 3℃)	≥ 8.62 S
Friction deviation (H=35 μ T, T=20 ± 3℃)	≤ 0.09°
Main semicircle self heterodyne correcting energy	1° ~ 45°
Secondary semicircle self heterodyne correcting energy	1° ~ 6° (magnetic inclination Q=45°)
Quadrant self heterodyne correcting energy	0.5° ~ 10°
Inclining self heterodyne correcting energy	- 75 ~ + 75 μ T
Lighting power supply	AC 220V, DC 24V
Outline Dimension	720 × 430 × 1200mm
Diameter of mounting holes	Pitchrow 420 Aperture Φ 16
weight	33kg

## Type CPT-130A Table Model Magnetic Compass

CPT-130A Magnetic Compass is a sort of table model liquid magnetic compass. The compass is a magnetic compass class A and it is designed and manufactured in accordance with the national standard GB/T 14108-2011 (General Technical Terms of Marine Magnetic Compass Class A), The product has the advantages of simple structure、complete function、convenient correcting difference、accurate direction、stabilization and reliable. The magnetic compass is suitable for the large and middle motorized fishing boats and small steel vessels acting as steering compass.



### Main technical parameters

Project	Data
Dial Diameter	Φ130mm
Dial graduation	0° ~ 360° 1° for each grid
Using temperature	-25°C~60°C
Indicating deviation (H=35 μ T, T=20 ± 3°C)	≤1.5°
Half period (H=35 μ T, T=20 ± 3°C)	≥5.59 S
Friction deviation (H=35 μ T, T=20 ± 3°C)	≤0.26°
Main semicircle self heterodyne correcting energy	1° ~ 45°
Quadrant self heterodyne correcting energy	0.5° ~ 7°
Inclining self heterodyne correcting energy	- 75 ~ + 75 μ T
Lighting power supply	DC 24V
Outline Dimension	390 × 240 × 370mm
Diameter of mounting holes	Pitchrow 214 ApertureΦ12
weight	7.5kg

## Type CPT-165A Table Model Magnetic Compass



CPT-165A Magnetic Compass is a sort of table model liquid magnetic compass. It is used for the middle and small vessels acting as steering compass. The compass is a magnetic compass class A and it is designed and manufactured on the basis of the national standard GB/T 14108-2011 (General Technical Terms of Marine Magnetic Compass Class A), its technical performance index are completely in accordance with the national standard. The product has the advantages of beautiful outline、high precision、convenient correcting difference、steady performance and legible lighting etc. It is the essential navigation instrument for the middle and small vessels.

### Main technical parameters

Project	Data
Dial Diameter	Φ165mm
Dial graduation	0° ~ 360° 1° for each grid
Using temperature	-25°C~60°C
Indicating deviation (H=35 μ T, T=20 ± 3°C)	≤0.5°
Half period (H=35 μ T, T=20 ± 3°C)	≥8.62 S
Friction deviation (H=35 μ T, T=20 ± 3°C)	≤0.09°
Main semicircle self heterodyne correcting energy	1° ~ 45°
Quadrant self heterodyne correcting energy	0.5° ~ 10°
Inclining self heterodyne correcting energy	- 75 ~ + 75 μ T
Lighting power supply	AC 220V, DC 24V
Outline Dimension	730 × 326 × 570mm
Diameter of mounting holes	Pitchrow 270 Aperture Φ12
weight	23kg

## Type CPT-130B Table Model Magnetic Compass

CPT-130B Magnetic Compass is a sort of table model liquid magnetic compass. The compass is a magnetic compass class A and it is designed and manufactured in accordance with the national standard GB/T 14108-2011 (General Technical Terms of Marine Magnetic Compass Class A). The product has the advantages of simple structure, complete function, convenient correcting difference, accurate direction, stabilization and reliable. The magnetic compass is suitable for the large and middle motorized fishing boats and small steel vessels acting as steering compass.



### Main technical parameters

Project	Data
Dial Diameter	Φ130mm
Dial graduation	0° ~ 360° 1° for each grid
Using temperature	-25℃~60℃
Indicating deviation (H=35 μ T, T=20±3℃)	≤1.5°
Half period (H=35 μ T, T=20±3℃)	≥5.59 S
Friction deviation (H=35 μ T, T=20±3℃)	≤0.26°
Main semicircle self heterodyne correcting energy	1° ~ 40°
Quadrant self heterodyne correcting energy	1° ~ 5°
Lighting power supply	DC 24V
Outline Dimension	380 × 240 × 330mm
Diameter of mounting holes	Pitchrow155 Aperture Φ10
weight	5.5kg

## Type CPT-130D Table Model Magnetic Compass



CPT-130D Magnetic Compass is a sort of table model liquid magnetic compass. The compass is a magnetic compass class A and it is designed and manufactured in accordance with the national standard GB/T 14108-2011 (General Technical Terms of Marine Magnetic Compass Class A). The product has the advantages of simple structure、 complete function、 convenient correcting difference、 accurate direction、 stabilization and reliable. The magnetic compass is suitable for the steel motorized fishing boats and small steel vessels acting as steering compass.

### Main technical parameters

Project	Data
Dial Diameter	Φ 130mm
Dial graduation	0° ~ 360° 1° for each grid
Using temperature	-20°C~60°C
Indicating deviation (H=35 μ T, T=20 ± 3°C)	≤1.5°
Half period (H=35 μ T, T=20 ± 3°C)	≥5.59 S
Friction deviation (H=35 μ T, T=20 ± 3°C)	≤0.26°
Main semicircle self heterodyne correcting energy	1° ~ 40°
Quadrant self heterodyne correcting energy	1° ~ 5°
Lighting power supply	DC 24V
Outline Dimension	330 × 200 × 270mm
Diameter of mounting holes	Pitchrow118 Aperture Φ 6.5
weight	3kg

## CX-65 Small Boat Magnetic Compass

CX-65 small boat magnetic compass is a good liquid magnetic compass. The compass is designed and manufactured in accordance with ISO 14227-2001 《Small Boat Magnetic Compass》 standard. Its actual dial diameter is 65mm, but the special spherical cover magnifies it to 85mm. The product has the advantages of simple structure、convenient using、accurate direction、high sensitivity legible dial etc. It is suitable for yachts、lifesaving boats、enclosed boats indicating course heading or distinguishing azimuth.



CX-65 Magnetic Compass



CX-65A Magnetic Compass

## Main technical parameters

Project	Data	
	CX-65 Magnetic Compass	CX-65A Magnetic Compass
Dial Diameter	Φ 65mm, magnifies Φ 85mm	Φ 65mm, magnifies Φ 85mm
Dial graduation	0° ~ 360° 5° for each grid	0° ~ 360° 5° for each grid
Using temperature	- 20°C ~ 60°C	- 20°C ~ 60°C
Indicating deviation (H=35 μ T, T=20 ± 3°C)	≤ 1.5°	≤ 1.5°
Half period (H=35 μ T, T=20 ± 3°C)	≥ 3 S	≥ 3 S
Friction deviation (H=35 μ T, T=20 ± 3°C)	≤ 1°	≤ 1°
Main semicircle self heterodyne correcting energy	0° ~ 30°	0° ~ 30°
Lighting power supply	DC 24V(12V)	DC 24V(12V)
Outline Dimension	135 × 135 × 135mm	130 × 130 × 150mm
Diameter of mounting holes	Pitchrow 124 Aperture Φ 6	Pitchrow 115 Aperture Φ 5
weight	1kg	0.8kg

## TMC-D/U Magnetic Compass Sensor



TMC-D/U magnetic compass sensor serves the purpose of communicating with the upper machine through a 485 interface half-duplex mode. The converter shifts course information into digital signals, which provides magnetic compass heading of information for the magnetic compass repeater, AIS and automatic helm and other marine equipments. It is used mainly in the nautical field, such as the ship automatic helm.

It complies with IEC 61162 HDM HDT output format, with steady operation. It can give the accurate reading of magnetic compass azimuth Angle, the output baud rate support 4800 bp/s, Its has a small size, light weight and low power consumption.

### Mechanical parameters

distinguishability	0.025°
Reading precision	0.5°

### Electric parameters

Voltage	24V DC
Consumption power	about 6W
Course heading serial interface	RS422 or RS232 ( NMEA )

## RAI900 Rudder Angle Indicating System

RAI900 rudder angle indicating system is utilized to accurately and opportunely exhibit the rudder angle signals at the specified locations, such as the navigating bridge and wheelhouse. The system can perform the following functions: collection, digitization, transmission, display (digital display and light-bar analog display) and control (for example, control of display brightness) of rudder angle signals.



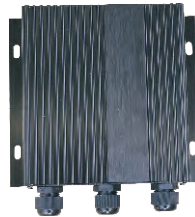
RAI900-2C Single waterproof indicator



RAI900-2A Single rudder angle indicator



RAI900-3 Rudder angle signal transmitter



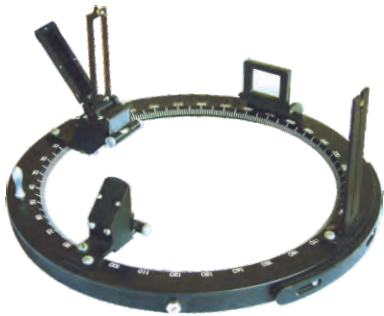
RAI900-4 Signal distributor



RAI900-1 Three-face rudder angle indicator

## Main Parameters

Project	Data
System rudder Angle display error	not more than 1° (relative to the actual rudder Angle)
Power supply	DC24V
Measurement range of rudder angle	-50° ~ +50°
Rudder angle sampling resolution	0.1° (12-digit A/D converter)
Rudder angle data transmission frequency	5 times/s
Default sampling step for linear compensation	5°
Input data port	RS-422 standard
Format of input data	in compliance with IEC-61162
ambient temperature	- 15°C ~ + 55°C
Humidity	93% ± 2% (ambient temperature 25°C ~ 40°C)



## Azimuth Circle of Magnetic Compass

GFC serial azimuth circles of magnetic compass are used for all specification of marine class A magnetic compass. GFC serial azimuth circles are designed and manufactured in accordance with shipbuilding industry standard GB/T 335-2005 《Marine Compass Azimuth Circle》.

### Specification

Type	Inside diameter	Outside diameter	Net weight
GFC-165	Φ226mm	Φ239mm	1.5kg
GFC-190	Φ247mm	Φ260mm	1.7kg
GFC-165A	Φ247mm	Φ260mm	1.7kg



## GFC-180 Azimuth Circle of Magnetic Compass

GFC-180 azimuth circle can be used for CGF-180 reflector magnetic compass and most of the foreign magnetic compasses. It adopts fixed mode by using positioning centre hole, the diameter of inner hole is 8mm. The azimuth circle has the advantages of simple structure and convenient operation etc.

## 19-F Bearing Repeater Compass

19-F bearing repeater compass is a newly designed and developed bearing repeater compass, it adopts latest electronic technology and computer technology and the digital course heading signal which accords with NMEA2.0(IEC 61162-1) sentences can be directly inputted, through computing relay and drive the dial which is similar to mechanical repeater compass running thereby indicating course heading of the vessel and simultaneously possessing digital display of course heading. Therefore the repeater compass is directly suitable for various digital main compass, such as Anschutz STD22, TKC, SPERRY, YOKOGAWA etc.

If the main compass is analog model, customer may use analog-to-digital converter of gyro compass to convert analog signal into digital signal and then matched with 19-F bearing repeater compass to form complete directional system.



### Mechanical parameters

distinguishability	0.025°
Reading precision	0.5°

### Electric parameters

Voltage	24V DC
Consumption power	about 6W
Course heading serial interface	Rs422 or RS232 ( NMEA )

### NMEA interface

Rs422 interface	4800 baud
1 starting position , 1 stopping position , without polarity checkout	
cycle time	120 ms
( sending information accords with NMEA-0183 standard 2.00 edition )	
Sentences accord with NMEA2.0(IEC 61162-1):	

\$xxHDT,xxx.x,T\*cc<CR><LF>

\$xxHDM,xxx.x,M\*cc<CR><LF>

\$xxHDG,xxx.x,,,,\*cc<CR><LF>



## CF-3 Heading Repeater Compass

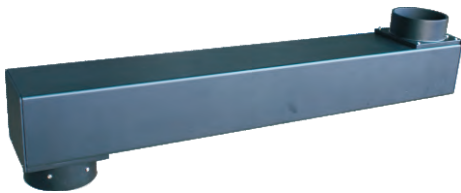
CF-3 heading repeater compass made by our company is a new type repeater compass, it has small volume and can be used for flush mounting, wall mounting or desk mounting. It can transmit the course heading indicated by the gyro compass to any places of the vessel where the course heading are needed, it adopts latest electronic technology and computer technology. If the signal of gyro compass is analog signal, you can use our modulus transducer to convert analog signal into digital signal and then inputted to the repeater compass.

### Mechanical parameters

distinguishability	0.025°
Reading precision	0.5°

### Electric parameters

Voltage	24V DC
Consumption power	about 6W
Course heading serial interface	RS422 or RS232 (NMEA)



**ZP-1 By-pass**

## Bearing Repeater Support

bearing repeater support has two kinds: vertical and wall-hanging. It is the latest support designed and manufactured by our factory in light of the international style. Its spare parts are basically moulded in a one-off manner, which is an advanced technology. Hence the sand or air hole or unstable size which may easily occur in the former sand-cast process can be avoided. The compass repeater is rational in structure, good-looking in appearance, firm and enduring, reasonable in price, hence a substitute of new generation for the bearing repeater support at home and abroad.

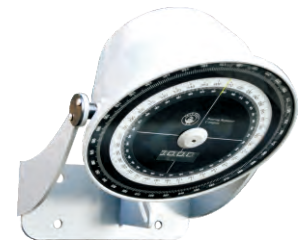
( According to customer's request to do bracket for TKC\SPERRY\YOKOGAWA and so on. )



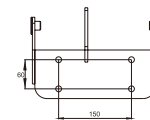
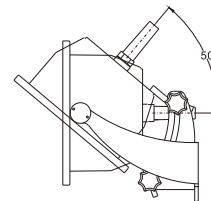
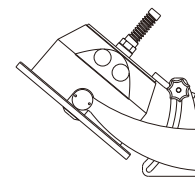
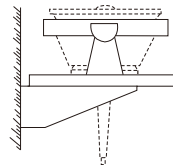
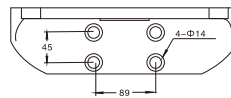
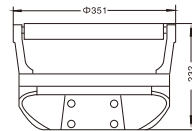
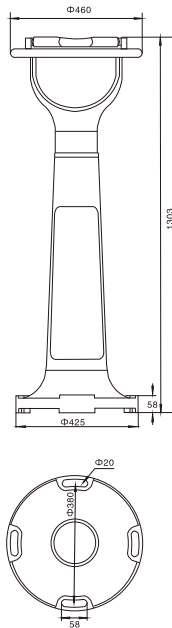
Vertical Type Bearing Repeater Support



Hang Type Bearing Repeater Support



Fixed hang type bearing repeater support





## CF-5 Digital Repeater Compass

CF-5 digital repeater compass is compact sized and characterized by a flexible installation. It adopts the latest electronic and computer technology, in which standard digital heading signal in accord with IEC61162-1 can be directly input, and the signal through calculation, conversion, drive, eventually in the double-display forms of azimuth angle plate and four digital tube indicates the real-time ship course.

## NMEA interface

Rs422 interface	4800 baud
1 starting position , 1 stopping position , without polarity checkout	
cycle time	120 ms
( sending information accords with NMEA-0183 standard 2.00 edition )	
Sentences accord with NMEA2.0(IEC 61162-1):	

\$xxHDT,xxx.x,T\*cc<CR><LF>

\$xxHDM,xxx.x,M\*cc<CR><LF>

\$xxHDG,xxx.x,,,,\*cc<CR><LF>



## SD-8 Signal Distributor

SD-8 Multiplex Signal Distributor distribute 1 channels asynchronous serial signal into 8 channels output equably, which have signal amplification function. order to satisfy the requirement, which assign the same signal source signal to modern ship's Navigation equipment, registering equipment, and automatic control equipment and so on

## LQ-200 Balance Weight Model Clinometer

LQ-200 Balance Weight Model Clinometer is manufactured in accordance with GB3376-91 《Marine Balance Weight Model Clinometer Technical Terms》 and is the indispensable instrument for the ship's support . It has the advantages of high sensitivity and indication accuracy. It is in concordance with the requirement of environment temperature´ vibration´ warm hot and salt mist etc. regulated by steel seagoing vessel standard.



### Main technical parameters

Project	Data
Indicating range	55° ~ 0° ~ 55°
Graduation value	1°
Indication accuracy	≤ ±0.4°
Sensitivity	≤ 0.4°
Weight	0.9kg
Outline Dimension	370 × 35 × 240mm

## 19-FY Azimuth Circle of Bearing Repeater Compass

It adopts aluminium alloy and diamagnetic brass and it has high precision . It can be matched with 19-F bearing repeater compass made by our company and other bearing repeater compasses made by the manufacturers at home and abroad .

