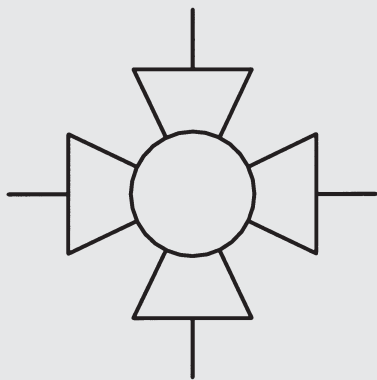
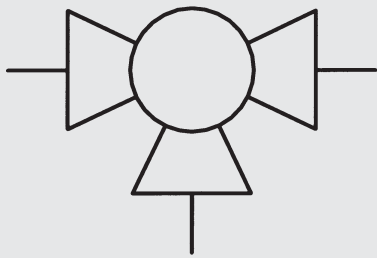
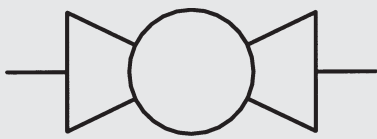
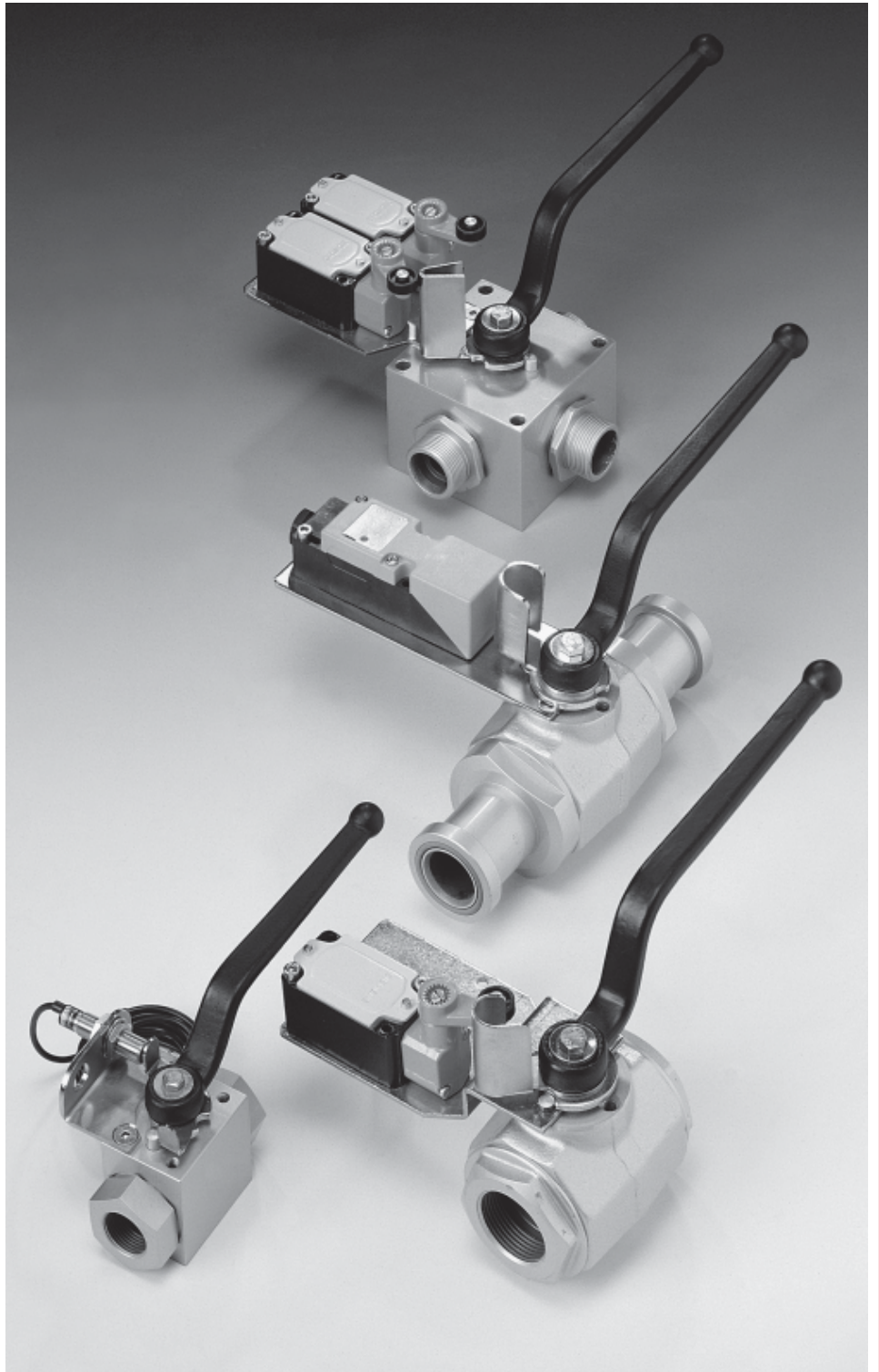


Ball Valves with Electrical Limit Controls



Up to 500 bar
Up to DN 300



1. DESCRIPTION

1.1. GENERAL

All HYDAC ball valves can be supplied with limit controls.

This is achieved by the addition of mechanical limit switches or inductive proximity switches. Depending on the customer requirement and the application, one or two limit controls are fitted.

Please see the HYDAC ball valves overview brochure, no.: 5.500../..

On request we can supply other models to cover nearly all applications.

1.2. FUNCTION

Limit controls serve to display the open and/or the closed position of the ball valve and therefore present the user with the possibility of remotely displaying or monitoring the switching position of the ball valve where greater automation is required in order to ensure greater safety.

There are two types of limit controls:

- Mechanical position switch
- Inductive proximity switch

1.3. APPLICATION

HYDAC ball valves with limit controls are used for controlled shut-off or flow diversion in hydraulic circuits.

Areas of application are, for example:

- Machine tools
- System engineering
- Mobile hydraulics

1.4. NOTES

Ball valves are not designed to be used as flow control valves; therefore they should always be either fully open or fully closed to avoid damaging the sealing cups.

To ensure correct functioning, the pressure and temperature specifications must be observed.

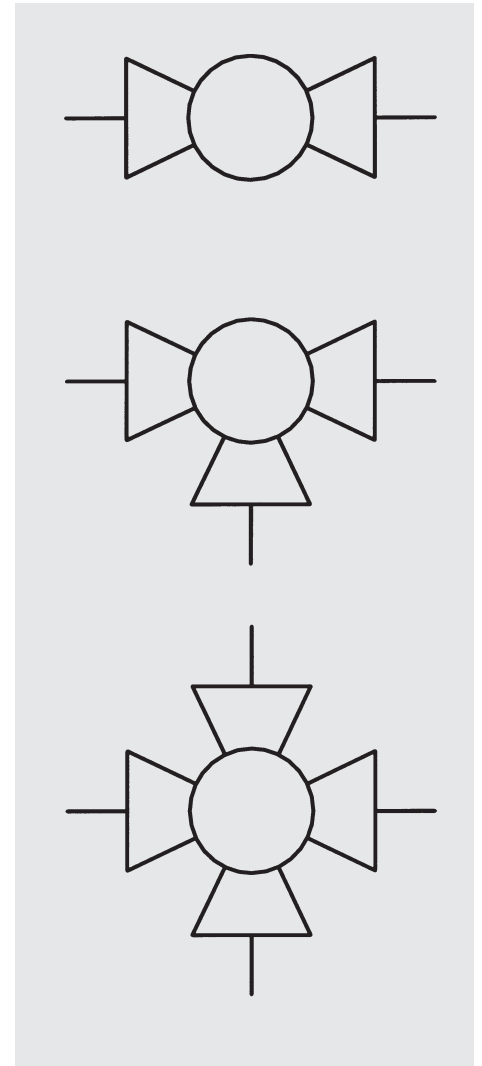
For sizes 04 to 50 the handles are supplied fitted, for size 65 and above the handles are supplied loose with the ball valves.

2. TECHNICAL SPECIFICATIONS

2.1. GENERAL

2.1.1 Designation and symbol

- 2-way ball valve
- 3-way change-over ball valve
- 3-way ball valve
- 4-way ball valve



2.2. MODEL CODE (limit switch)
(also ordering example)

KHM-G2-1114-16X - E - 1 . 000

Designation

Type of ball valve

Limit control

E = limit switch (position switch)

Monitored switching position

- 1 = monitoring of ball valve in open position
- 2 = monitoring of ball valve in closed position
- 3 = monitoring of ball valve in open and closed position

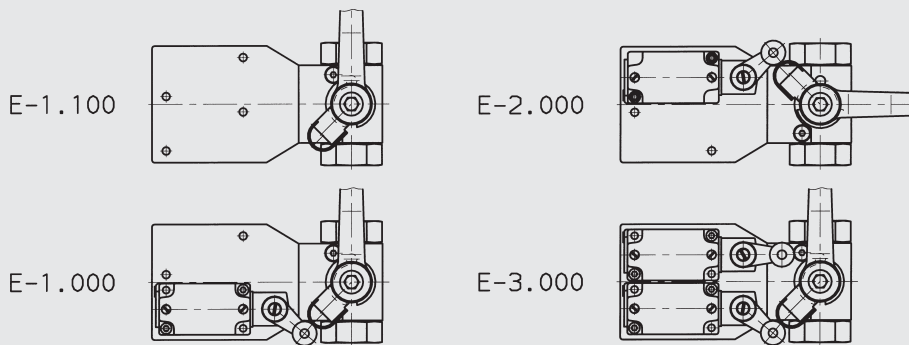
Limit switch code

- 000 = limit switch to DIN EN 50041 – Form A
- 100 = adapted for limit switch to DIN EN 50041 – Form A
- ... = on request nearly all commercially available makes and safety types can be supplied

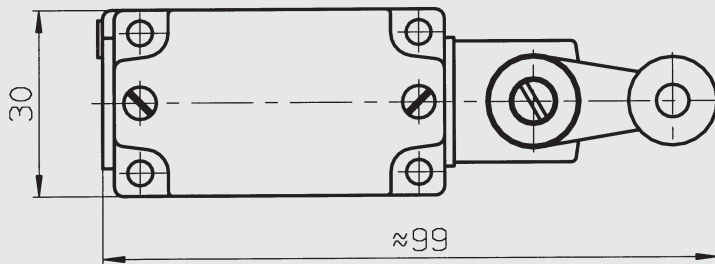
2.2.3 **Electrical details for limit switch**

- Position switch to DIN EN 50041 Form A, with rocker switch.
- Switch equipment:
1 normally closed contact,
1 normally open contact
- Safety type IP 67
- Insulation group: 500 V AC
- Continuous current: 10 A
- Nominal voltage: 300 V AC
- Mechanical service life:
30 x 10⁶ switching cycles
- Switching frequency:
6 x 10³ switching cycles per hour
- Permissible ambient temperature:
-40 to +85 °C

2.2.1 **Examples of different models**



2.2.2 **Limit switch**



2.3. MODEL CODE (inductive proximity switch)
(also ordering example)

KHM-G2-1114-16X - I - 1 . 000

Designation

Type of ball valve

Limit control

I = inductive proximity switch

Monitored switching position

- 1 = monitoring of ball valve in open position
- 2 = monitoring of ball valve in closed position
- 3 = monitoring of ball valve in open and closed position

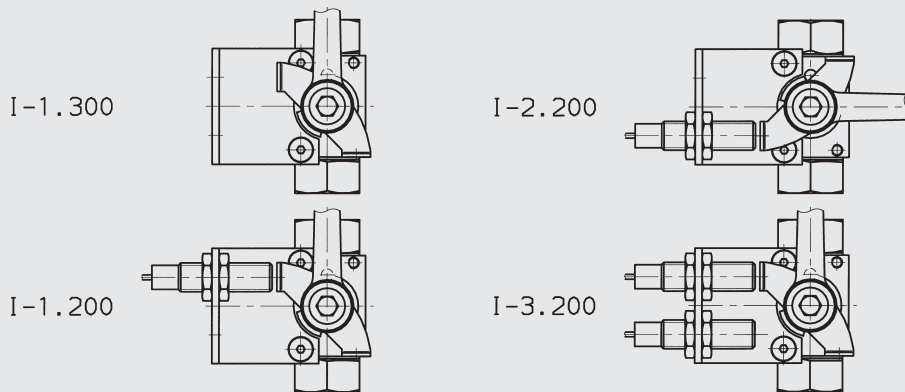
Proximity switch code

- 000 = adapted for proximity switch (plate without mounting holes)
- 100 = adapted for block-type proximity switch to DIN EN 60947 type: I1C40
- 200 = with built-in cylindrical proximity switch M12 to DIN EN 60947 type: I1A12
- 300 = adapted for cylindrical proximity switch M12 to DIN EN 60947 type: I1A12
- ... = on request nearly all commercially available makes and safety types can be supplied

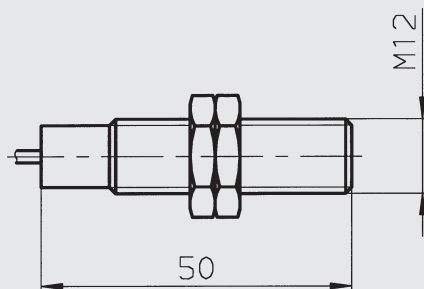
2.3.3 Electrical details for inductive proximity switch

- Inductive proximity switch, cylindrical form M12 to DIN EN 60947 – type: I1A12AP1
- Rated switching distance: 2 mm
- Output: plus – normally open contact / PNP
- Safety type IP 67
- Operating voltage: 10 – 30 V DC (including residual ripple)
- Nominal voltage: 12 – 24 V DC
- Short-circuit and overload protection
- Switching current: ≤ 200 mA
- Current consumption without load: < 11 mA
- Switching hysteresis: 10%
- Switching frequency: 800 Hz
- Permissible ambient temperature: -25 to +70 °C
- Function display: LED
- Type of connection: Cable 3 x 0.14 mm² x 2 m

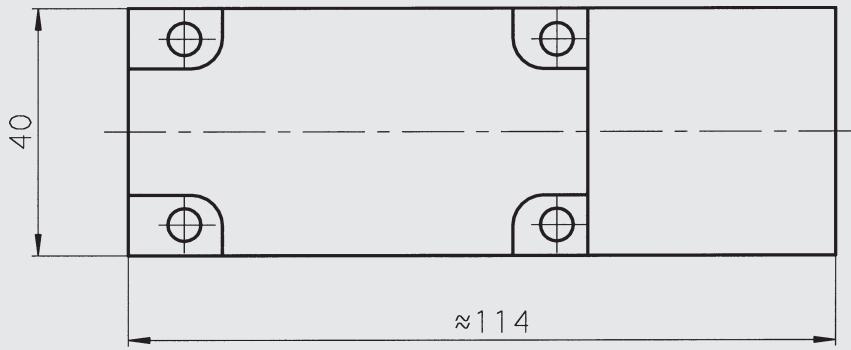
2.3.1 Examples of different models



2.3.2 Inductive proximity switch



2.3.4 Block type inductive proximity switch



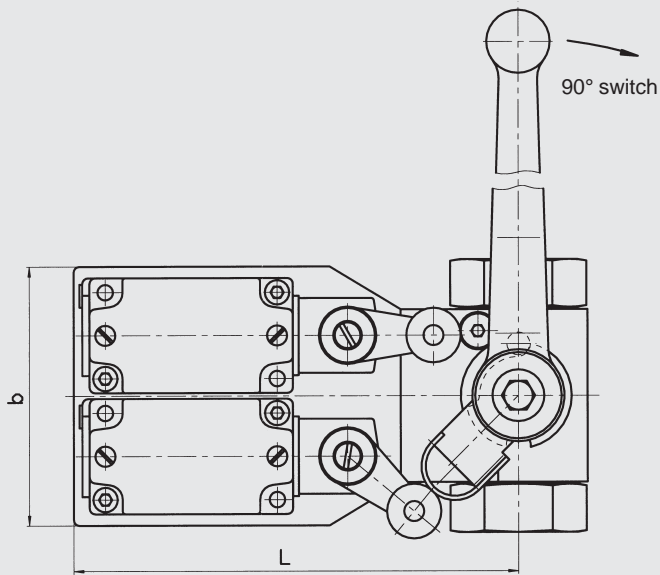
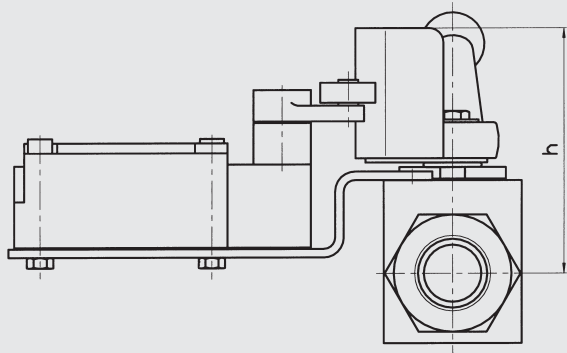
2.3.5 Block type inductive proximity switch

- Block type inductive proximity switch to DIN EN 60947 – type I1C40
- Technical specifications differ depending on the manufacturer and type of construction and must be requested separately.

3. DIMENSIONS

3.1. BALL VALVE WITH LIMIT SWITCH

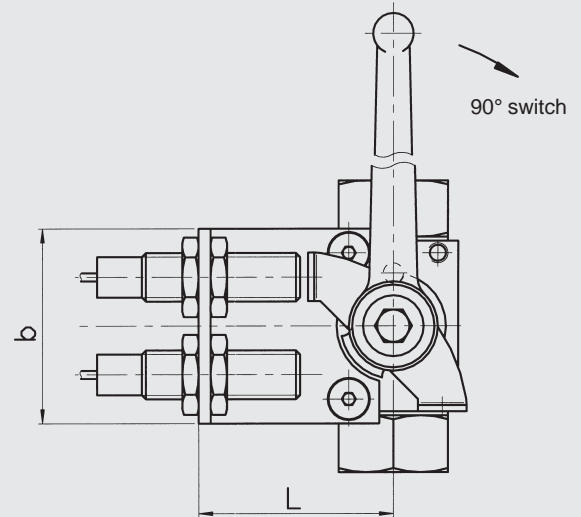
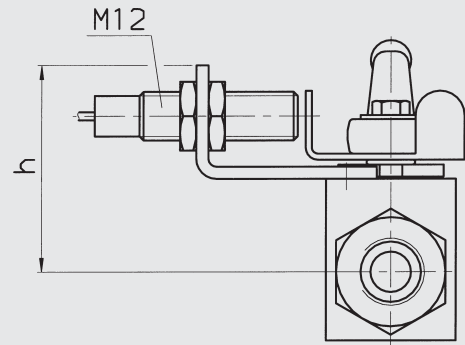
KHB - E-3.000



DN	L	b	h
04/06	155	90	75
08/10/13	155	90	75
16	155	90	82
20	155	90	87
25	155	90	90
32	155	90	103
40	155	90	109
50	155	90	115

3.2. BALL VALVE WITH INDUCTIVE PROXIMITY SWITCH M12

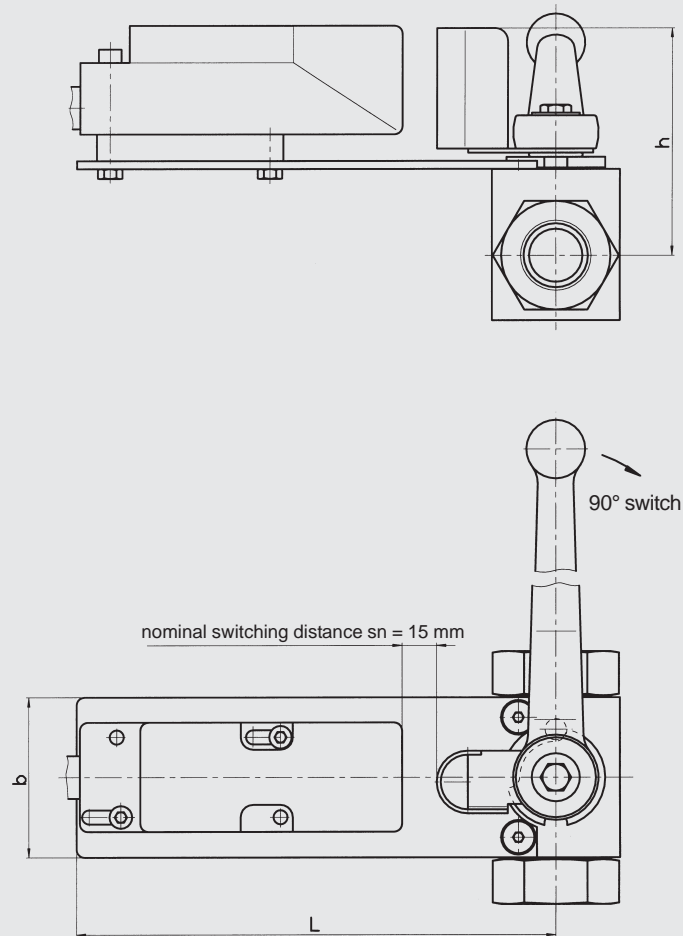
KHB - I-3.200



DN	L	b	h
04/06	45	47	59
08/10/13	46	47	51
16	46	47	54
20	49	60	61
25	49	60	64
32	50	60	78
40	50	60	84
50	50	60	91

3.3. BALL VALVE WITH BLOCK TYPE INDUCTIVE PROXIMITY SWITCH

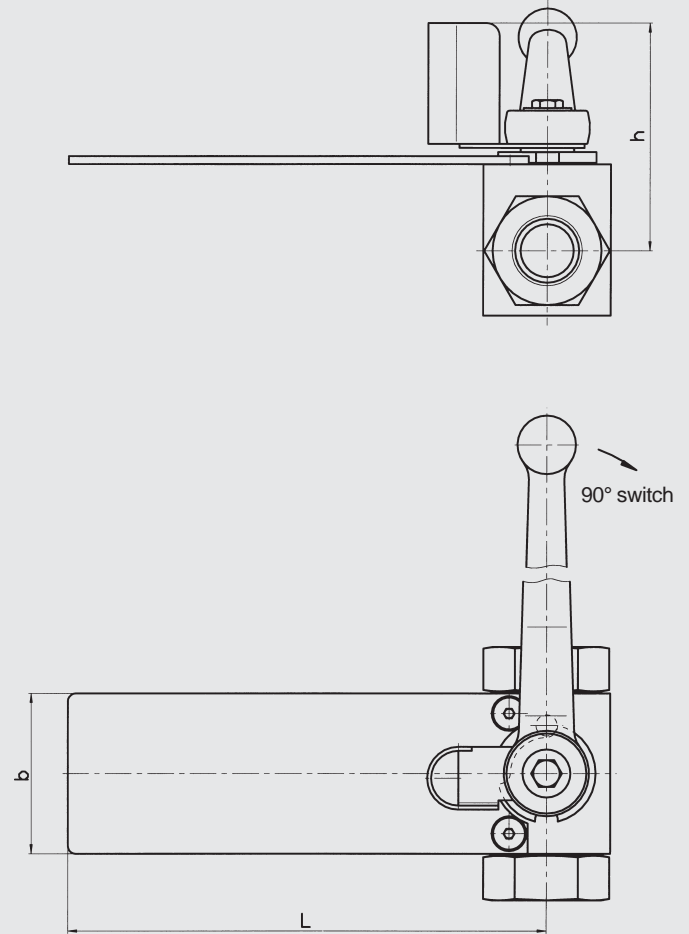
KHB - I-1.XXX



DN	L	b	h
04/06	180	60	75
08/10/13	180	60	75
16	180	60	82
20	180	60	87
25	180	60	90
32	180	60	103
40	180	60	109
50	180	60	115

3.4. BALL VALVE ADAPTED FOR PROXIMITY SWITCH

KHB - I-1.000



DN	L	b	h
04/06	180	60	75
08/10/13	180	60	75
16	180	60	82
20	180	60	87
25	180	60	90
32	180	60	103
40	180	60	109
50	180	60	115

4. SPARE PARTS

Add-on kit for electrical switching position monitoring can be supplied on request.

5. NOTE

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.