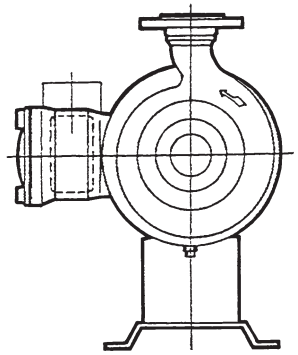
# TEIKOKU
## CANNED MOTOR PUMPS

**World's Largest Manufacturer of Canned Motor Pumps**

**ISO 9001 CERTIFIED**

# TEIKOKU CANNED MOTOR PUMPS
## DESIGNED FOR ZERO LEAKAGE SERVICES IN THE CPI



Centered Suction and Discharge for easier piping design and installation, with either ANSI raised face flanges or other standards as requested.

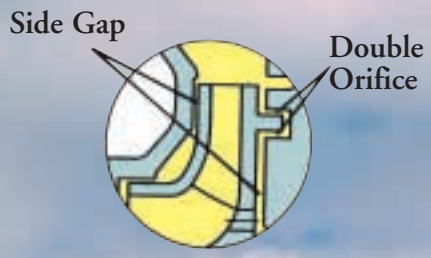
TEIKOKU, the world's largest supplier of canned motor pumps presents a state-of-the-art, sealless pump.

No newcomer to the field, TEIKOKU has provided customers with proven Canned Motor Pumps for 40 years. Over 400,000 units have been installed worldwide, covering every application.

TEIKOKU is unique in that we design and manufacture both pumps and motors, thus insuring our customers total quality control.

The TEIKOKU Canned Motor Pump replaces conventional sealed pumps providing safer, more efficient operation. This is especially advantageous when pumping hazardous or hard to handle materials.

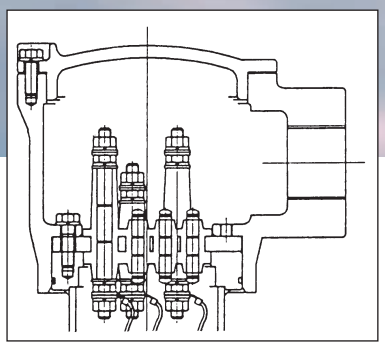
**TEIKOKU THRUST BALANCE SYSTEM**




**Noncontacting double orifice permits minimum leakage and improves volumetric efficiency. Enclosed impeller with optimum side gap keeps hydraulic losses at a minimum as well.**

**Vacuum dried, $N_2$ purged stator with Class C or F insulation**

**No coupling alignment is required.**
**No mechanical seal is required.**

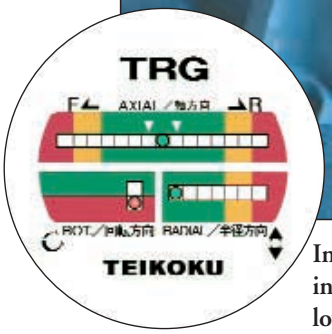


Improved terminal plates seal off higher pressure from inside, and a waterproof terminal box assures safe outdoor operation. All motor-pumps are provided with an explosion proof terminal box.

TEIKOKU provides expertise and assistance in selecting the pump best suited to our customer's specific needs. We have experience with horizontal standard pumps, vertical designs with either pump top or motor top, pumps and motors jacketed for either cooling or heating, self priming, submerged, slurry design, super-heat resistant pumps and more.

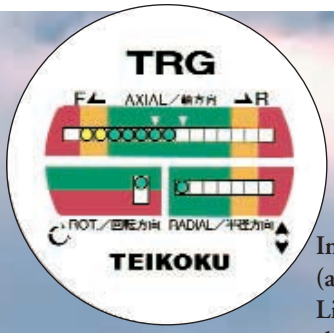
# TEIKOKU ROTARY GUARDIAN
## BEARING WEAR MONITOR

Each Teikoku Canned Motor Pump comes with the patented Teikoku Rotary Guardian (TRG) — an electrical meter that continuously monitors both axial and radial wear. The TRG indicates any serious malfunction of the pump before a failure occurs; many users opt to have the TRG connected to an alarming device.

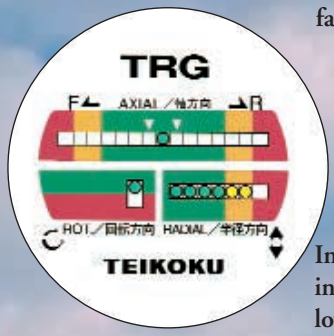



Incorrect rotation is indicated by light at lower left.

In Teikoku's factory testing lab, all pumps are 100% performance-tested before shipment.



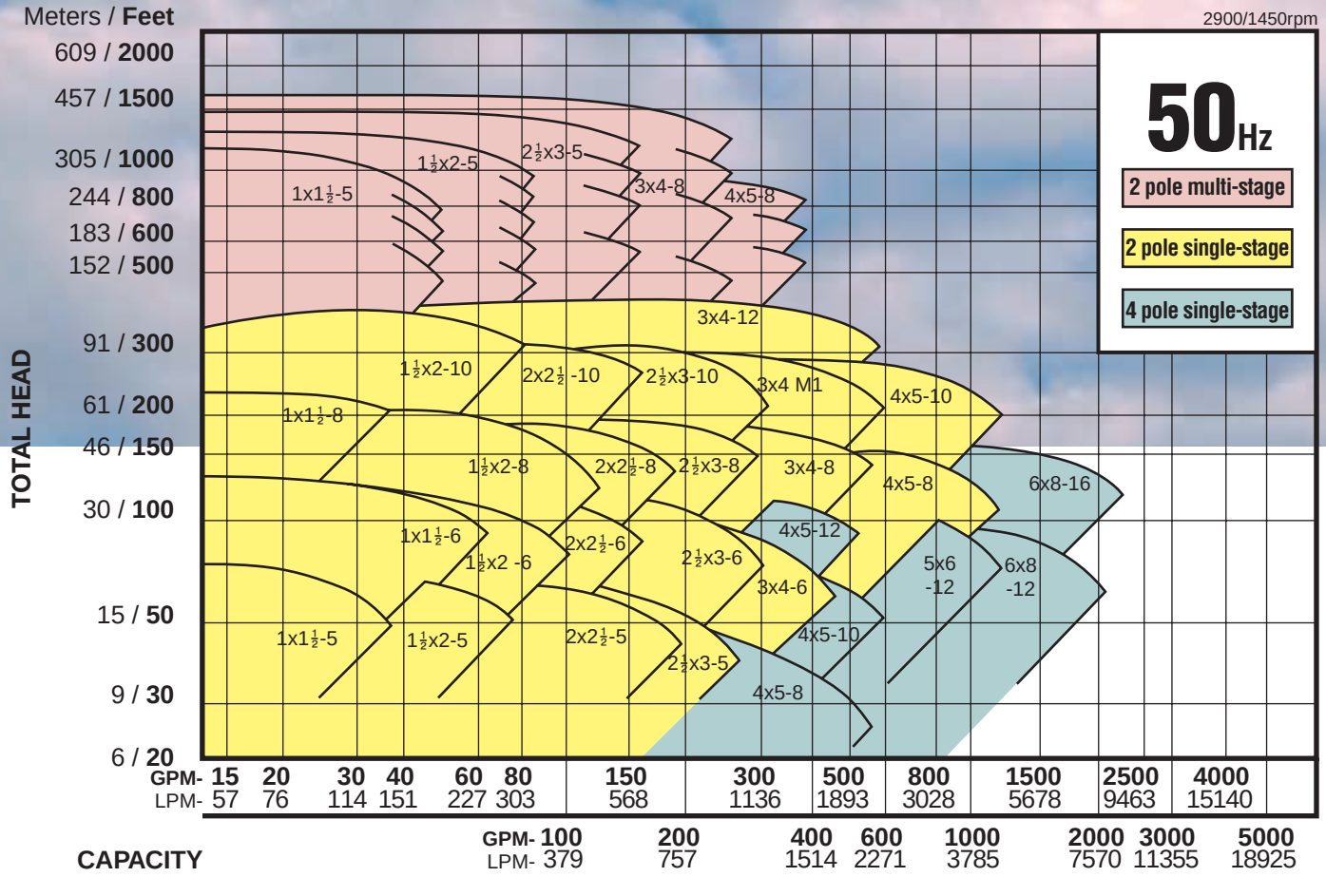

Incorrect rotor position (axial wear) is indicated. Lights at top show that the rotor is situated too far forward.




Incorrect radial wear is indicated by lights at lower right.


This photograph demonstrates how the Rotary Guardian continnuously provides accurate, incremental metering of unseen axial and radial wear. The computer graphic below the TRG illustrates corresponding changes within the monitored pump (these changes would be concealed within an actual canned motor pump).

Teikoku's various product lines include zero-leakage canned motor pumps, mixers and accessories. All pumps are available in vertical configuration for longer pump life and minimal space usage in plants and other processing facilities.


Meters / Feet
609 / 2000
457 / 1500
305 / 1000
244 / 800
183 / 600
152 / 500
91 / 300
61 / 200
46 / 150
30 / 100
15 / 50
9 / 30
6 / 20
TOTAL HEAD
2900/1450rpm
50Hz
2 pole multi-stage
2 pole single-stage
4 pole single-stage
1x1½-5
1½x2-5
2½x3-5
3x4-8
4x5-8
3x4-12
1½x2-10
2x2½-10
2½x3-10
3x4 M1
4x5-10
1x1½-8
1½x2-8
2x2½-8
2½x3-8
3x4-8
4x5-8
6x8-16
1x1½-6
1½x2 -6
2x2½-6
2½x3-6
4x5-12
3x4-6
5x6 -12
6x8 -12
1x1½-5
1½x2-5
2x2½-5
2½x3-5
4x5-10
4x5-8
GPM- 15 20 30 40 60 80 150 300 500 800 1500 2500 4000
LPM- 57 76 114 151 227 303 568 1136 1893 3028 5678 9463 15140
CAPACITY
GPM- 100 200 400 600 1000 2000 3000 5000
LPM- 379 757 1514 2271 3785 7570 11355 18925

**HIGH TEMPERATURE service pumps are available in two versions. Type F with ceramic insulated motor windings (no motor cooling is required) and Type B with cooling jacket on motor with class C insulation.**

# TYPE F X MOTOR (CERAMIC INSULATION)

**the simplest construction makes it more reliable**

| | | | | |
|---|---|---|---|---|
| **Pump size** | : | 1.5 x 1 x 5 | to | 4 x 5 x 10 |
| **3,600 RPM motor** | : | 2 HP / 1.5 kw | to | 75 HP / 55 kw |
| **1,800 RPM motor** | : | 5 HP / 3.7 kw | to | 25 HP / 18.5 kw |

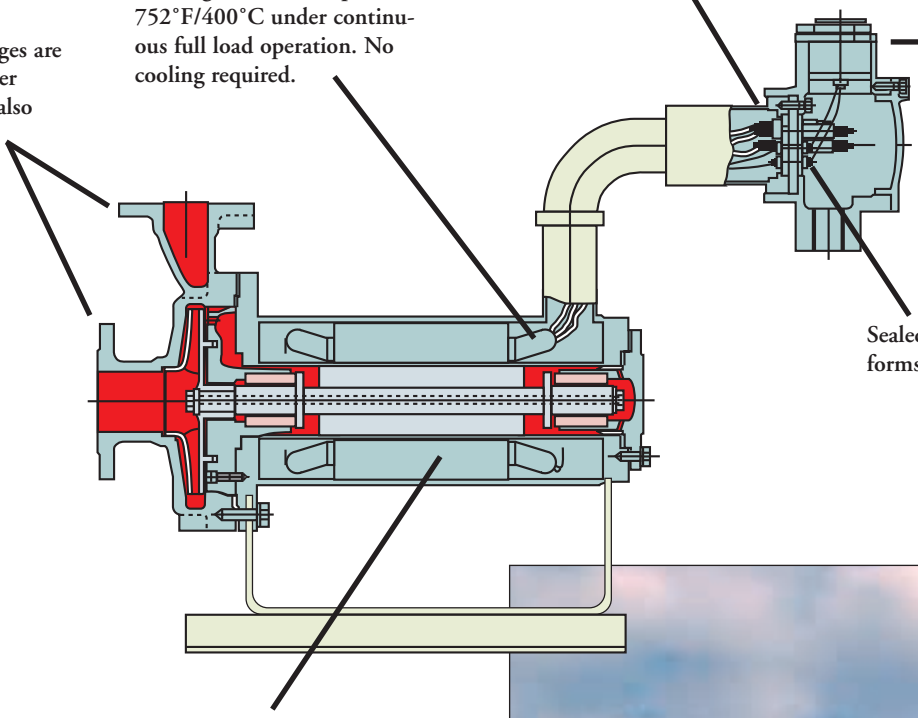
Maximum allowable liquid temperature, 750°F / 400°C. Standard pressure rating up to 430 psi/30 bar.

Extended motor leads to keep heat from reaching terminals and bearing monitors.

Bearing Monitor (TRG) is standard on all pumps.

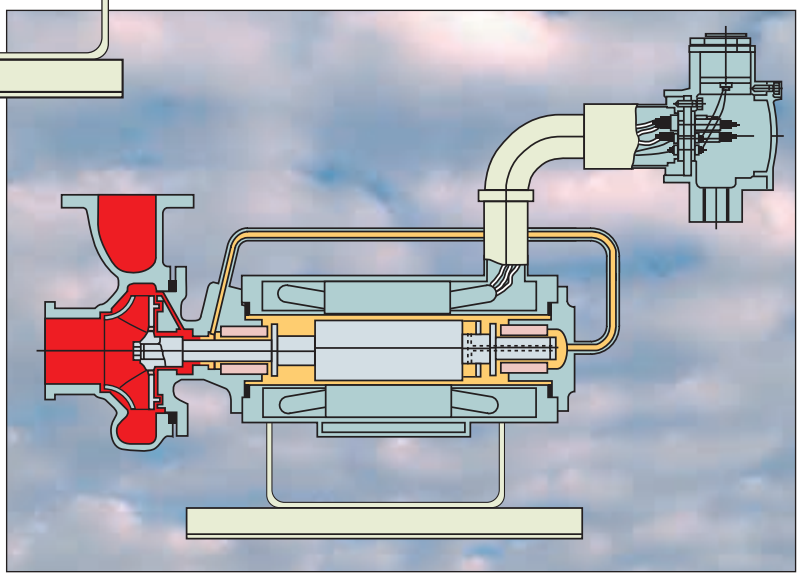
Ceramic insulated motor windings withstand up to 752°F/400°C under continuous full load operation. No cooling required.

ANSI RF flanges are standard. Other standards are also available.



Sealed terminal plate forms true containment.

Dynamically and hydraulically balanced single rotating element is FREE-FLOATING in the hot liquid. This allows no thermal stress or impact on either the shaft or the bearings.
No degrading of alignment or coupling problems.



**X-TYPE (HIGH-TEMPERATURE-INSULATION TYPES)**
In high temperature and frequent heat-cycle applications, a special tube recirculates the lubrication liquid WITHOUT NEED FOR EXTERNAL COOLING.

# TYPE B WITH BUILT-IN HEAT EXCHANGER AND MOTOR COOLING JACKET

- **Toughest against temperture changes and all thermal upsets**
- **Wider selection than any other sealless pumps**
- **No mechanical seal, no ball bearings, no coupling – No leakage**
- **Selections can be made from**

| | | | | |
|---|---|---|---|---|
| **Pump size** | : | 1.5 x 1 x 5 | to | 8 x 10 x 15 |
| **3,600 RPM motor** | : | 1.5 HP / 1.1 kw | to | 233 HP / 175 kw |
| **1,800 RPM motor** | : | 3 HP / 2.2 kw | to | 160 HP / 120 kw |

Maximum allowable liquid temperature, 850°F / 455°C regardless of the motor size. Pressure rating up to 5,000 psi/350 bar.

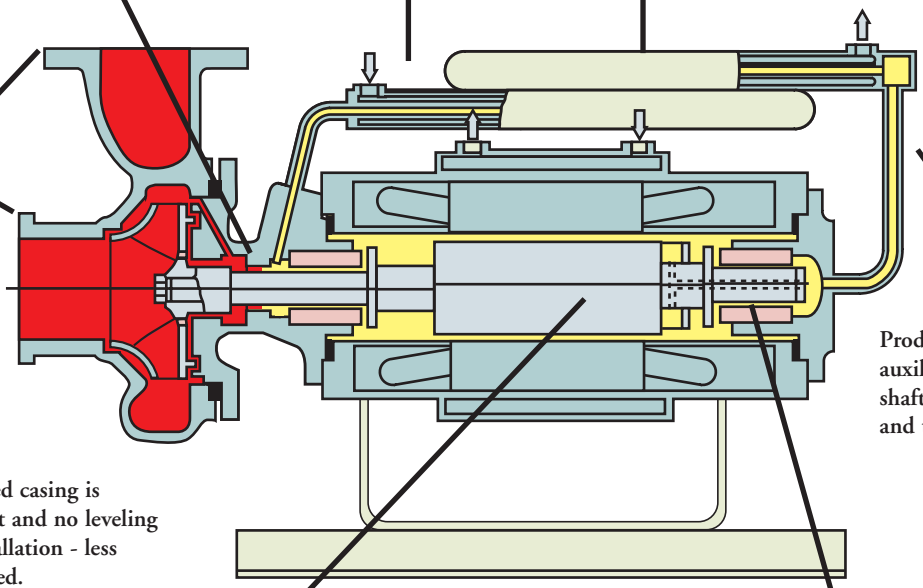
Hot liquid as high as 850°F comes in and out of pump casing, but heat conduction to motor is kept to a minimum by the adaptor neck - Casing and motor are thermally isolated, but hydraulically connected.

There is no substantial exchange between Hot main stream and Cooled circulation stream.

Bearing Monitor (TRG) mounted on terminal box. Sealed terminal plate and true secondary containment.

Heat exchanger keeps the circulating liquid as low as 300°F/150°C while main stream is 850°F/455°C.

ANSI RF flanges are standard. Other standards are also available.



Product is pumped by the auxiliary impeller fixed on the shaft to circulate through bearings and the heat exchanger.

No centerline supported casing is required. No alignment and no leveling are required. Easy installation - less mounting space required.

"Free Floating" single rotating element eliminates problems common with sealed and mag drive pumps.

Back-pull-out design for easier maintenance.

Long lasting and self-lubricating carbon graphite bearings are toughest against heat and thermal impact.

## Product Range/Limitations on Application

| | Standard | | Upon Request | |
|---|---|---|---|---|
| CAPACITY (max) | 4,227 GPM | 16 $m^3$/min | 10,500 GPM | 40 m3/min |
| TDH (max) | 2,000 ft. | 609 m | 2,500 ft. | 600 m |
| TEMPERATURE* | -112 to 716°F | -80 to 380°C | -328 to 842°F | -200 to 450°C |
| VISCOSITY (max) | 100 cst | 100 cst | 350 cst | 350cst |
| DESIGN PRESSURE (max) | 430 psi | 30 bars | 5,000 psi | 350 bars |
| MOTOR HORSEPOWER (max) | 230 HP | 175 KW | 667 HP | 500 KW |
| MAJOR MATERIALS OF WETTED PARTS | 304SS, 316SS | | 304LSS, Hastelloy, Titanium, alloy 20 | |

*temperature of pumped liquid

# OPTIONS

## NEW COMPACT DIGITAL PUMP LOAD CONTROL

### Detect Loss of Load
- Dry running
- No prime
- Cavitation

### Detect Overload
- Jammed impeller
- Bad bearings

### 2 Adjustable Set Points
**LOW TRIP - When load is below the Low Trip, the built-in relay will trip.**
- Dry running
- Loss of prime
- Plugged or closed inlet

**HIGH TRIP - When the load is above the High Trip, the built-in relay will trip.**
- Jammed impeller
- Bearing failure

### Filter Out Nuisance Trips
- Adjustable Digital On-Delay Timers: Trip won't activate until the selected delay time is exceeded.

- Adjustable Digital Start-up Timer: no false trips while motor is starting