PROJECT:_____

CUSTOMER:_____

ENGINEER:_____

PUMP MANUFACTURER:_____

MODEL: GPL+GLU

LIMITED SERVICE FULL VOLTAGE ACROSS THE LINE START ELECTRIC FIRE PUMP CONTROLLER AND AUTOMATIC POWER TRANSFER SWITCH FOR SECOND UTILITY EMERGENCY POWER SOURCE

DRAWING SUBMITTAL PACKAGE

CONTENTS

NOTE: The drawings included in this package are for controllers covered under our standard product offering. Actual "AS BUILT" drawings may differ from what is shown in this package.

GPL MODEL

Limited service pump controller

Full voltage across-the-line starter
3-phase and single phase

The model GPL across-the-line starter (full voltage) limited service pump controller built to the latest NFPA 20 and UL218 Standards provides for:

• Full voltage across-the-line starting. Peak inrush current is approximately 6 times the full load motor current. Inrush current and starting torque are not reduced.
NOTE: Voltage at the controller line terminal shall not drop more than 15% below controller rated voltage under motor starting conditions.

• 3-phase - 3-wire or 1-phase - 2-wire motor connection assures error free field installation and simple change of motor rotation.
The limited service pump controller is limited to 30HP max. and across-the-line starting. It does not provide accurate "locked rotor" protection and is subject to acceptance by the "authority having jurisdiction".

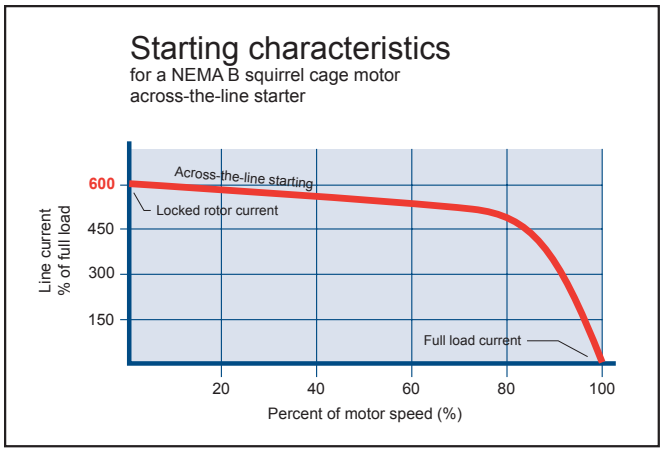
This controller can only be utilized where the capacity of the electric power source and the electric supply utility permits full voltage starting of a squirrel cage motor. (Not recommended for use on generator set installations due to high inrush current.)

Only quality components, all U.L. listed or recognized and C.S.A. certified are used throughout to assure the best possible reliability.

The complete assembled and wired controllers are factory tested before shipping and ready for immediate installation.

SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT
(where acceptable by local code)

This controller meets the NFPA 20 requirements for connection to a normal power source only. For normal and alternate power sources, add a listed automatic transfer switch (Model GLG or GLU). Pump controller and automatic transfer switch will be supplied as one unit.



NFPA® MEMBER 09 -10

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CE

OPTIONAL

CSA®

CONTROLLER PROTECTION LEVEL:

- **Standard NEMA - UL - CSA type 2**
- Optional NEMA - UL - CSA type 3, type 4, type 4X, type 12

CONTROLLER DIMENSIONS:

- 30'' (762mm) high
  24'' (610mm) wide
  10'' (254mm) deep

OPERATIONAL TEMPERATURE LIMITS:

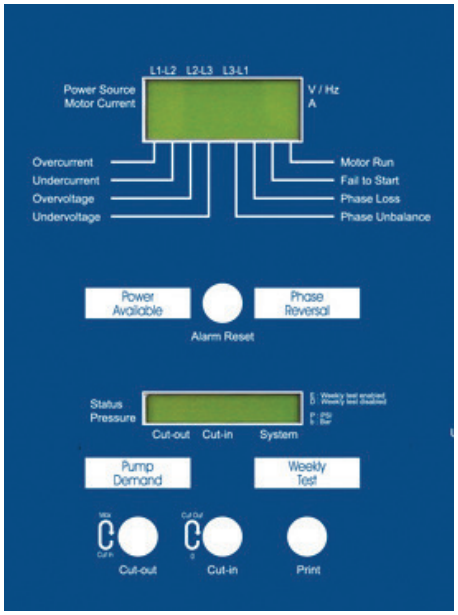
- 41ºF to 122ºF (5ºC to 50ºC)

WITHSTAND RATING (short circuit current):

	STANDARD	OPTIONAL
208V. to 240V.	65,000 A.Sym.	NOT AVAILABLE
380V. to 480V.	25,000 A.Sym.	65,000 A. Sym.
600V.	18,000 A.Sym.	25,000 A. Sym.

GPL
MODEL

Limited service pump controller
Full voltage across-the-line starter
3-phase and single phase



STANDARD FEATURES:

MANUAL OPERATORS (DOOR MOUNTED)
- Circuit breaker operator door interlocked in the “ON” position
- Start and Stop push buttons

MANUAL OPERATOR (SIDE MOUNTED)
- Emergency manual start handle, providing for manual across-the-line starting of motor start contactor

CONTROL FEATURES
- Across-the-line motor start contactor HP rated
- Voltage surge suppressor connected to load terminals of the circuit breaker
- Remote start circuit
- Minimum running period timer
- Sequential start timer
- Weekly test
- Built-in pressure transducer

DRY ALARM CONTACTS - 8A. - 250VAC
Three phase model:
- Power or phase failure and/or circuit breaker in open position - DPDT
- Phase reversal - DPDT
- Pump run – 1N/O – 1N/C

Single phase model:
- Power and/or circuit breaker in open position - DPDT
- Pump run – 1N/O – 1N/C

ANNUNCIATOR AND LCD DISPLAY

Voltage and amperage module
Provides for:
- Phase sequence / Loss monitoring & alarms
- Individual phase-to-phase voltage indication
- Individual phase current indication
- True elapsed run time
- Motor run visual indication
- Over & under current visual indication
- Over & under voltage visual indication
- Fail to start visual indication
- Phase loss visual indication
- Phase unbalance visual indication
- Power available LED
- Phase reversal LED

Pressure and Sequencer module
Provides for:
- Cut-In & Cut-Out pressure setting
- System pressure indication
- Run period timer
- Sequential start timer
- Weekly test setting
- Pressure recording
- Alarm & events recording
- Pump on demand LED
- Weekly test LED
- USB slave communication port
- Printer (optional)
- Modem (optional)

OPTIONAL FEATURES:

Type A: OPERATIONAL MODIFICATIONS

Option A3: **Deluge valve provision** required when remote water control equipment is connected to the fire pump controller
Option A4: **Flow switch provision** required when the fire pump motor has to start upon the detection of a water flow prior to a pressure drop and not to stop until there is no more flow detection in the system.
Option A8: **Concentrate foam pump application**: Removal of pressure transducer and installation of two terminals for connection of a remote fire pump start contact.

Type B: ADDITIONAL ANNUNCIATIONS

Option B7: **Low suction pilot light**. (Pressure switch not included. See Options D1 and C5.)

Type C: EXTRA ALARM CONTACTS

Option C4: **Weekly exercise cycle alarm contacts**.
Option C5: **Low suction pressure alarm contacts**. (Pressure switch not included. See Options D1 and B7.)

Type D: MISCELLANEOUS

Option D1: **Low suction pressure switch** for fresh water mounted inside the controller. (See Options B7 and C5.)
Option D10: **Mounting feet**
Option D11: **NEMA 4 - assembly** for pump section only.
Option D12: **NEMA 4X - assembly** for pump section only.
Option D13: **High withstand rating** for fire pump section only. 65 kA for 380V. to 480V. ; 25 kA for 600V.
Option D17A: **Printer**
Option D18: **CE listing**
Option D19: **French labeling**
Option D20: **Spanish labeling**
Option D21: **Labeling in language other than English, French or Spanish**
Option D22: **NEMA 3 - assembly** for pump section only.
Option D23: **NEMA 12 - assembly** for pump section only.

Type H: EXPORT PACKING

Option H1: Export packing for 1 controller Model GPL

HOW TO ORDER:	GPL -	V /	HP /	Ph /	Hz	+ options
Ex.:	**GPL -**	208 /	20 /	3 /	60	**+** options

Tornatech inc., 7075, Place Robert-Joncas, # 132, Montreal, Quebec, Canada H4M 2Z2

Tel.: + 1 514 334 0523 + **1 800 363 8448** (Canada & U.S.A.) Fax: + 1 514 334 5448
E-mail: tornatech@tornatech.com **www.tornatech.com**

GPL-BRO-001/E Rev.3

TORNA TECH

ISO 9001

NEMA Member

GLG GLU MODEL

Automatic transfer switch

for Generator or Second utility emergency power and Limited service pump controller

Model GPL

Model GLG:
The model GLG automatic transfer switches for generator emergency power are specifically designed for pump service and built to the latest NFPA standard 20 and UL 218 standards.

The complete assembled, wired and tested combination provides short circuit protection and locked rotor protection for the transfer switch normal power position.

The alternate (emergency) power position is short circuit protected by a remote mounted circuit breaker or fuse set supplied by others.

The transfer switch is electrically operated and mechanically held in the normal or alternate (emergency) position. Manual operation of the transfer switch is provided for.

If the generator capacity exceeds 225% of the full load current of the motors, a model GLU (automatic transfer switch for a second utility) must be installed instead. **NFPA-20-2003**

Model GLU:
The model GLU automatic transfer switches for 2nd utility power supply are specifically designed for pump service and built to the latest NFPA standard 20 and UL 218 standards.

The complete assembled, wired and tested combination provides for a coordinated short circuit withstand rating for both the transfer switch and pump controller normal and 2nd utility power circuits.

The transfer switch is electrically operated and mechanically held in the normal or alternate (emergency) position. Manual operation of the transfer switch is provided for.

They are meant to be attached to a **Model GPL** limited service pump controller and supplied as one unit.

Only quality components, all U.L. listed or recognized and/or C.S.A. certified are used throughout to assure the best possible reliability.

The complete assembled and wired controllers are factory tested before shipping and ready for immediate installation.

NFPA MEMBER 09-10

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OPTIONAL

CONTROLLER PROTECTION LEVEL:
- **Standard NEMA - UL - CSA type 2**
- Optional NEMA - UL - CSA type 3, type 4, type 4X, type 12

OPERATIONAL TEMPERATURE LIMITS:
- 41°F to 122°F (5°C to 50°C)

CONTROLLER DIMENSIONS: (including pump section GPL)
- 24" (610mm) high
  42" (1067mm) wide
  10" (254mm) deep

OPTIONAL FEATURES:

Type E: **Load shedding contacts** for pump controller complete with automatic transfer switch

Option E1: **Permanent load shedding contacts**. Contacts change position when the pump controller is connected to the alternate power source and the motor run contactor is energized.

Type F: Transfer switch modifications

Option F3 - **NEMA 3 - assembly** for transfer switch section only.
Option F4 - **NEMA 4 - assembly** for transfer switch section only.
Option F5 - **NEMA 4X - assembly** for transfer switch section only..
Option F6 - **High withstand rating** for model GLU only. 65kA for 380V. to 480V., 25kA for 600V.
Option F8 - **NEMA 12 - assembly** for transfer switch section only.

Type H: **Export Packing**

Option H2: Export packaging for 1 controller Model GPL + GLG/GLU

GLG-GLU
MODEL

Automatic transfer switch
for Generator or Second utility emergency power and Limited service pump controller
Model GPL

STANDARD FEATURES:

- One molded case switch (Model GLG) or one circuit breaker (Model GLU) for the alternate (emergency) power supply complete with manual operator door interlocked in the ON position and padlock provision in the OFF position.

- One automatic transfer switch suitably rated to match the electrical rating (Model GLG) or the electrical rating and the short circuit withstand rating (Model GLU) of the normal power circuit of the associated pump controller.

- One Test push button to momentarily simulate a normal power failure. In Model GLG, this action will close the engine start contact after a 1-second time delay and start the alternate (emergency) power generator. At full generator voltage, the transfer switch will switch from normal to alternate (emergency) power. After releasing the Test push button, the transfer switch will switch back to normal power. In Model GLU, this action will cause a 1-second delay before switchover to 2nd utility power. After releasing the Test push button, the transfer switch will switch back to normal power.

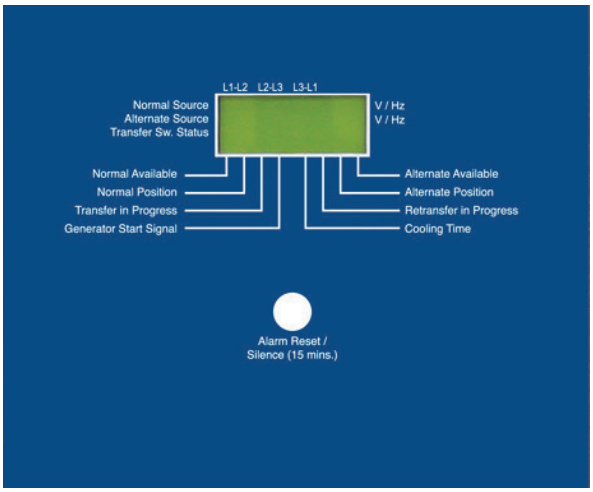
- Audible and visual alarm when isolating switch in OFF position.

- Time delays:
  - To override momentary normal power outages before activating engine start contact or transfer to 2nd utility. Factory set at 3 seconds.
  - To retransfer to normal power. Instantaneous retransfer in case of alternate (emergency) power failure. Factory set at 5 minutes. (can be by-passed)
  - To allow engine generator cool-down after retransfer to normal source. (If applicable). Factory set at 5 minutes.

- Voltage, frequency and phase reversal sensing:
  - Voltage sensing on all phases of normal power, set at 85%. A voltage below this value or phase reversal initiates generator start or transfer to 2nd utility.
  - Alternate (emergency) voltage and frequency sensing set at 90%. A voltage or frequency above this value initiates transfer to alternate (emergency) power.
  - Voltage sensing on all phases of normal power, set at 90%. A voltage above this value initiates retransfer to normal power.

TRANSFER SWITCH ANNUNCIATOR and LCD DISPLAY

- **DRY ALARM CONTACTS FOR:**
  - Generator start DPDT, 8 A. 250 V.AC or 5 A. 24 V.DC
  - Isolating switch in OFF position DPDT, 8 A. 250 V.AC
  - Automatic transfer switch in normal power position, 1 N/O
  - Automatic transfer switch in alternate (emergency) power position, 1 N/O



Voltage module

Provides for:

- Phase reversal indication
- Individual phase-to-phase voltage indication for each source of power
- Transfer switch status indication
- Normal power available indication
- Alternate power available indication
- Normal position indication
- Alternate position indication
- Transfer in progress indication
- Re-transfer in progress indication
- Generator start signal indication
- Cooling time indication
- Alarm reset / Silence pushbutton

HOW TO ORDER: **GLG or GLU -** V / HP / Ph / Hz **+** options

Ex.: **GLG or GLU -** 208 / 20 / 3 / 60 **+** options

Tornatech inc., 7075, Place Robert-Joncas # 132, Montreal, Quebec, Canada H4M 2Z2

Tel.: + 1 514 334 0523 + 1 800 363 8448 (Canada & U.S.A.) Fax: + 1 514 334 5448

E-mail: tornatech@tornatech.com www.tornatech.com

GLG-GLU-BRO-001/E Rev.3

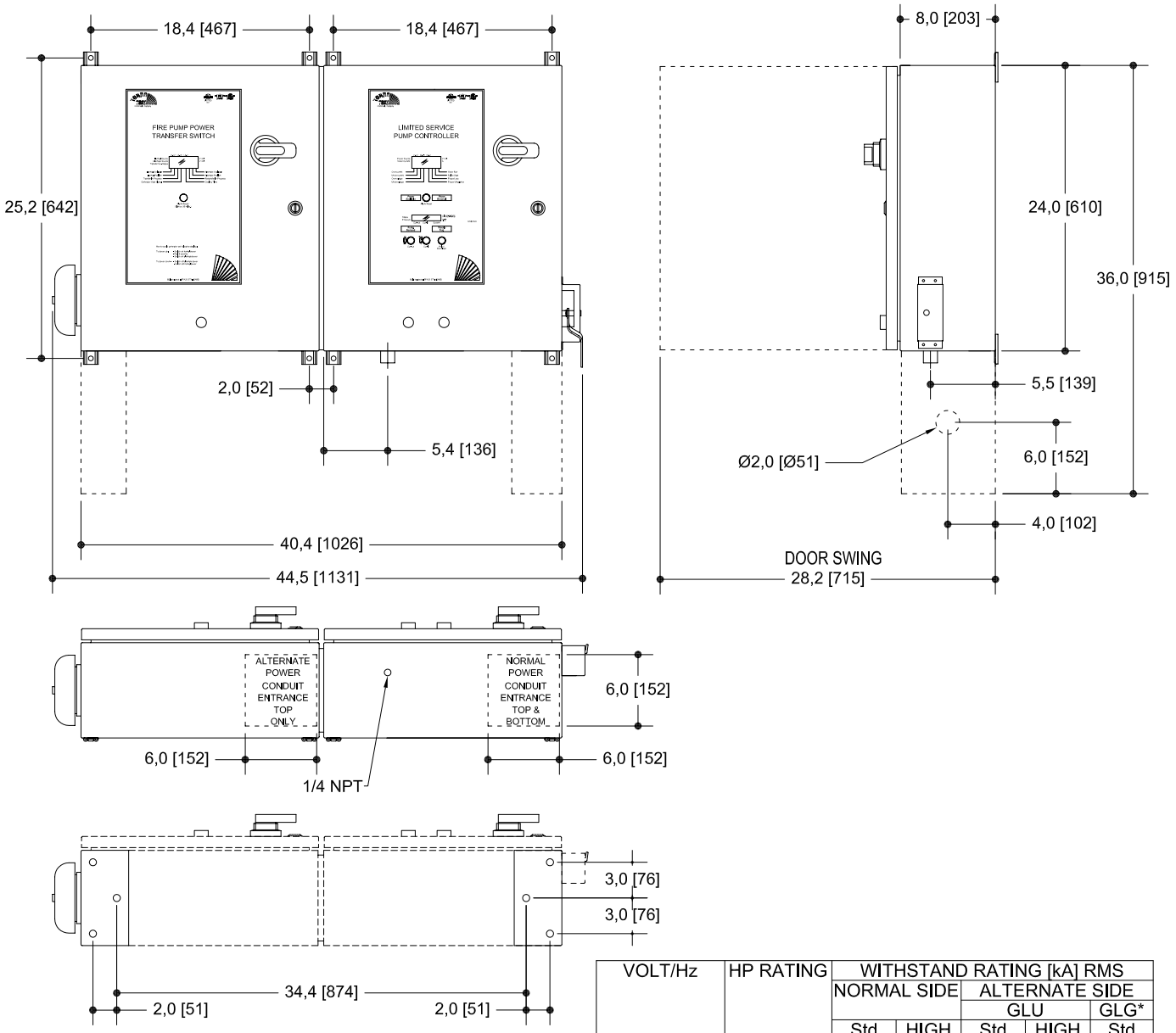
LIMITED SERVICE PUMP CONTROLLER
1 AND 3 PHASES

MODEL : GPL & GLG or GLU

Dimensions

BUILT TO LATEST NFPA 20 STANDARD EDITION

This controller meets the NFPA 20 requirements for connection to a normal & alternate power supply only.
This controller must be used together with listed fire pump automatic transfer switch (Model GLG or GLU)



VOLT/Hz	HP RATING		WITHSTAND RATING [kA] RMS				
			NORMAL SIDE		ALTERNATE SIDE		
					GLU		GLG*
	MIN	MAX	Std	HIGH (OPT. D13)	Std	HIGH (OPT. F6)	Std
1 PHASE							
200-208 / 60	3	15	65	65	65	65	65
230-240 / 50-60	3	15	65	65	65	65	65
3 PHASES							
200-208 / 60	3	30	65	65	65	65	65
230-240 / 50-60	3	30	65	65	65	65	65
380-416 / 50-60	3	30	25	65	25	65	25
440-480 / 50-60	3	30	25	65	25	65	25
575-600 / 60	3	30	18	25	18	25	18

NOTES :

- ALL DIMENSIONS ARE IN INCHES (MILLIMETERS).
- FINISHED FIRE PUMP RED.
- BOTTOM CONDUIT ENTRANCE RECOMMENDED.
- USE WATERTIGHT CONDUIT CONNECTOR ONLY.
- PROTECT EQUIPMENT AGAINST DRILLING CHIPS.
- AMBIANT TEMPERATURE : BETWEEN 41°F (5°C) AND 122°F (50°C).
- FOR ELECTRICAL RATING & OPTIONS INCLUDED, SEE RATING LABEL.

* APPLIES ONLY WHEN GENERATOR SET IS PROTECTED BY A MOLDED CASE CIRCUIT BREAKER NOT EXCEEDING THE AMPERE RATING OF THE TRANSFER SWITCH (SUPPLIED WITH GENERATOR).

NEMA 2 ENCLOSURE (STD)

SHIPPING WEIGHT
250 LBS - 114 KG

WALL MOUNT. (STANDARD)
FEET MOUNT.(OPT. D10)

Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
For drawing for approval or installation, please contact manufacturer.

B

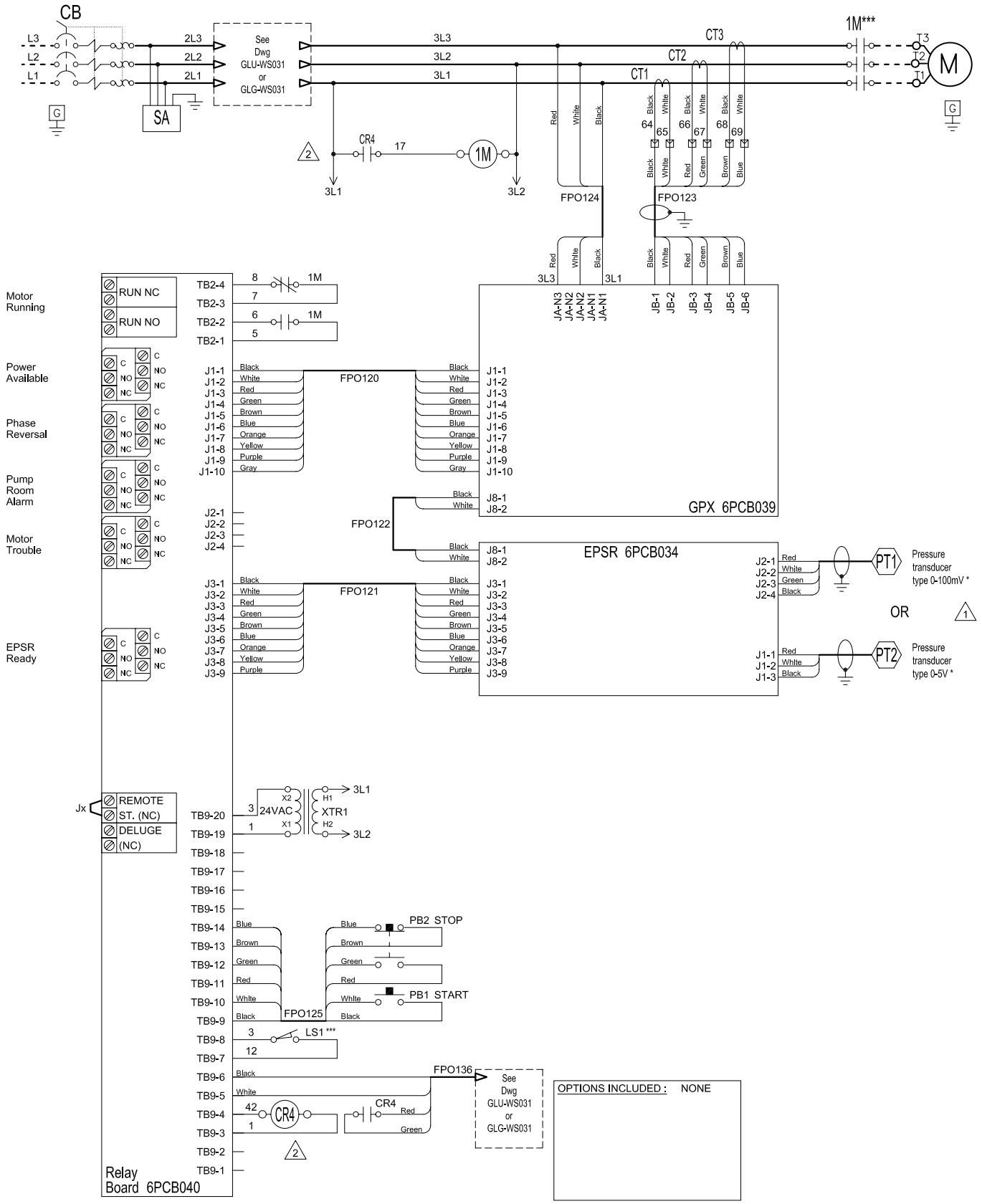
TORNATECH ISO 9001 REGISTERED

NEMA

GPLDIM					DRAWING No.
				DES.	
0.	06/07/10	FIRST ISSUE	B	VER.	GPL-DI002/E
REV.	DATE	DESCRIPTION		APP.	

LIMITED SERVICE CONTROLLER
3 PHASES
Wiring schematic

MODEL : GPL
& GLG or GLU
BUILT TO LATEST NFPA 20 STANDARD EDITION



OPTIONS INCLUDED : NONE

Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
For drawing for approval or installation, please contact manufacturer.

* Only 1 transducer is installed
*** Contact closed when Emergency Start is in ON position

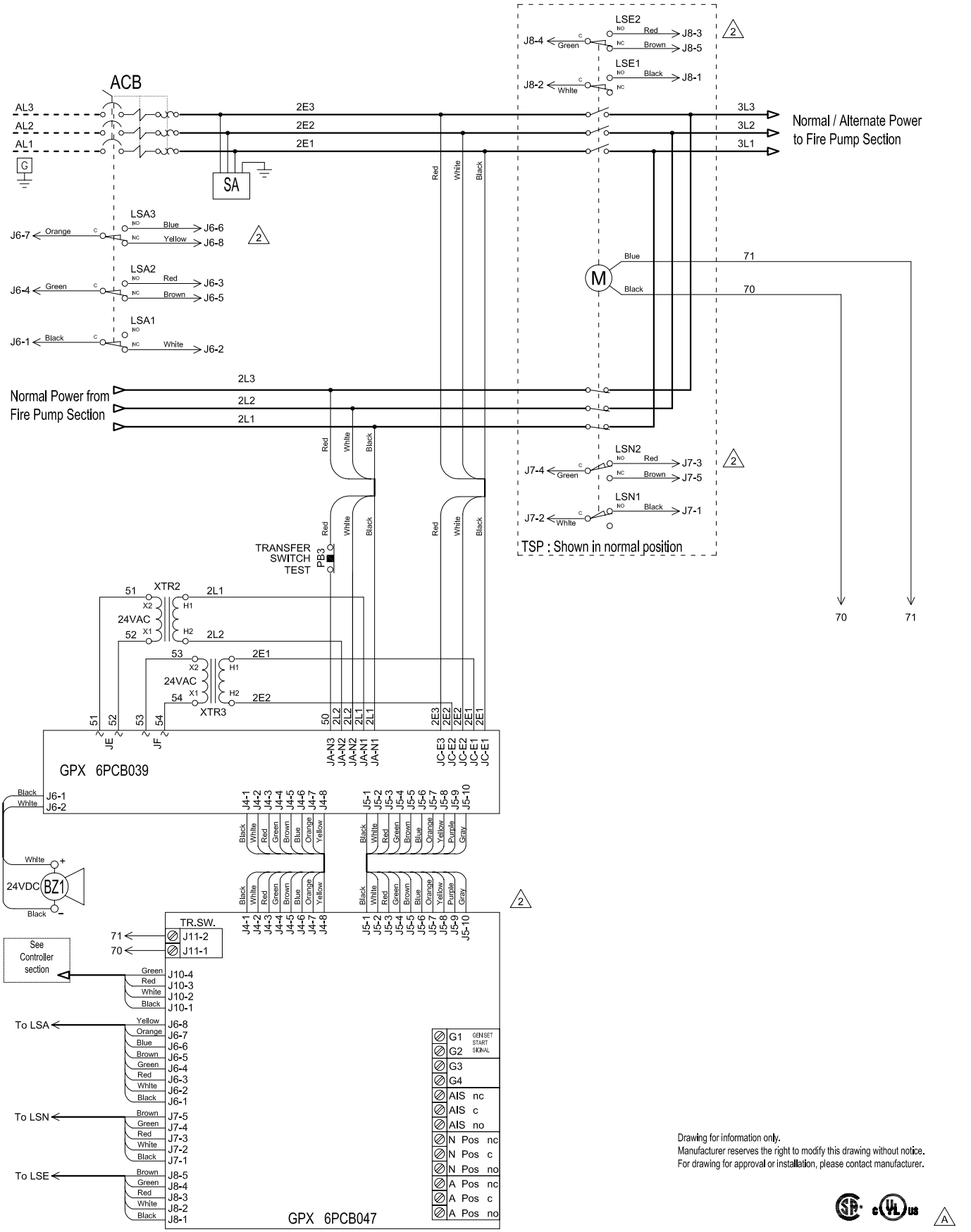
ISO 9001 REGISTERED

GPLWS	2.	07/11/29	RELAY & CONT. RENAM.	A	DES.	Drawing No. GPL-WS032 /E
	1.	07/04/13	PT2		VER.	
	REV.	DATE	DESCRIPTION		APP.	Options included : NONE

AUTOMATIC TRANSFER SWITCH
3 PHASES
Wiring schematic

MODEL : GLU

BUILT TO LATEST NFPA 20 STANDARD EDITION



Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
For drawing for approval or installation, please contact manufacturer.

GPLTS

REV.	DATE	DESCRIPTION		APP.
2.	07/11/29	CIRCUIT MODIFIED	A	DES.
1.	06/08/16	LSA2 CONNECTION		VER.

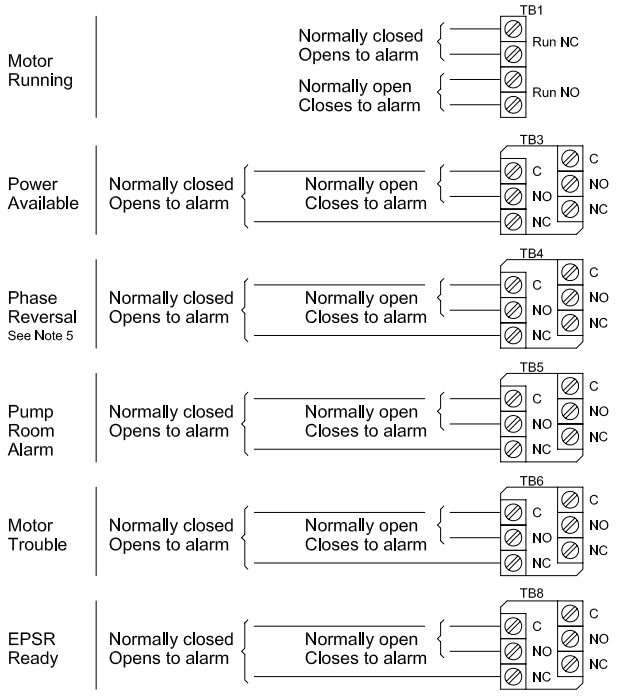
Drawing No.
GLU-WS031/E

TORNATECH ISO 9001 REGISTERED
KEMA Member

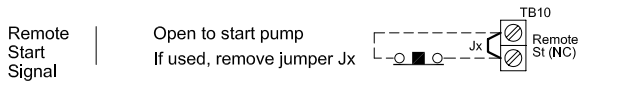
LIMITED SERVICE CONTROLLER
1 or 3 PHASES
Terminal diagram

MODEL : GPL
BUILT TO LATEST NFPA 20 STANDARD EDITION

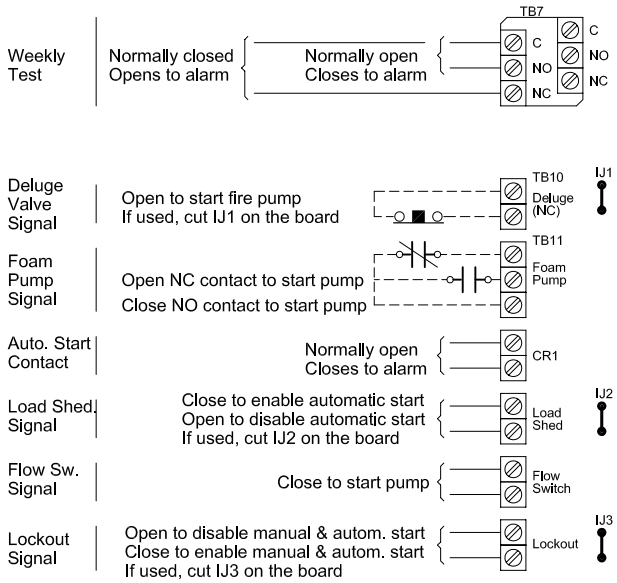
Remote Alarm Terminal Blocks



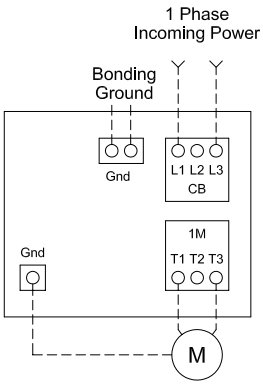
Control Terminal Block



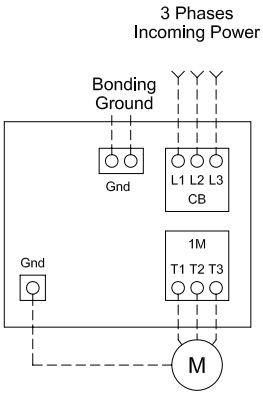
Optional Terminal Blocks



Power Terminals for GPL - 1 Phase



Power Terminals for GPL - 3 Phases



MAXIMUM MOTOR HORSEPOWER							LINE SIDE		LOAD SIDE	
MODEL 1 PHASE		MODEL 3 PHASES								
200-208V	220-240V	200-208V	220-240V	380-416V	440-480V	550-600V	LINE TERMINALS	MAXIMUM WIRE SIZE (*)	LOAD TERMINALS	MAXIMUM WIRE SIZE (*)
7.5	7.5	15	15	30	30	30	10 to 1/0 AWG	1 AWG	10 to 3 AWG	3 AWG
15	15	25	30	-	-	-	3 to 3/0 AWG	1 AWG	14 to 2/0 AWG	1 AWG
-	-	30	-	-	-	-	14 to 1/0 AWG	1 AWG	14 to 2/0 AWG	1 AWG

(*) : Maximun wiring size only for wire entering the cabinet in wall opposite the terminals
For wires entering from others walls use maximum line terminal capacities.

GROUND TERMINAL (**)	MOTOR GROUND LUG	BENDING SPACE	
		INCH	mm
14 to 1/0 AWG	14 to 6 AWG	3	76

(**) : Ground terminal suitable for service entrance bounding & grounding, when accepted by authority having jurisdiction.

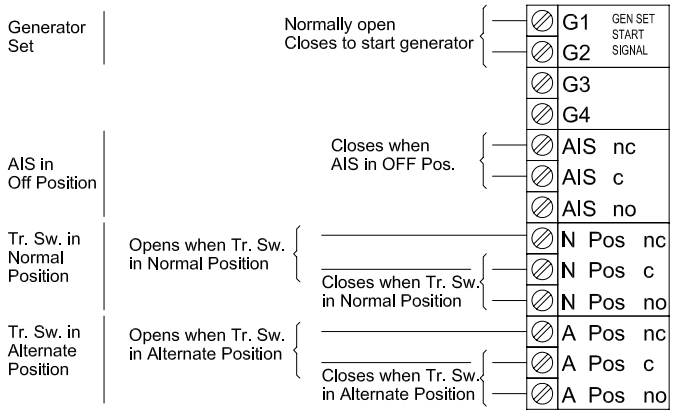
Notes:
1 - For proper wire sizing, refer to NFPA20 and NEC (USA) or CEC (Canada) or local code.
2 - Controller suitable for service entrance in USA.
3 - For more accurate motor connections refer to motor manufacturer or motor nameplate.
4 - Controller is phase sensitive. Incoming lines must be connected in ABC.
5 - For GPL 1 phase, phase reversal relay is always off.

Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
For drawing for approval or installation, please contact manufacturer.

AUTOMATIC TRANSFER SWITCH — MODEL : GLG or GLU

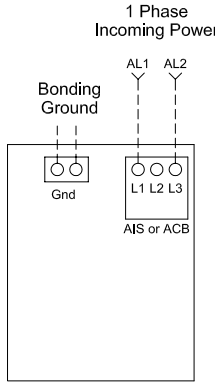
Terminal diagram — BUILT TO LATEST NFPA 20 STANDARD EDITION

Remote Alarm Terminal Blocks

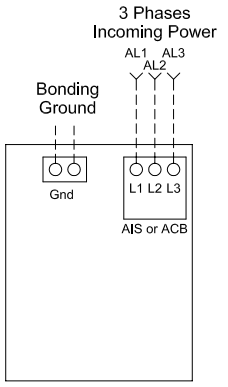


Power Terminals

GLG / GLU - 1 Phase



GLG / GLU - 3 Phases



Notes:
1 - Controller is phase sensitive. Incoming lines must be connected in ABC

MAXIMUM MOTOR HORSEPOWER							LINE SIDE FOR MODEL GLG		LINE SIDE FOR MODEL GLU		GROUND (**) TERMINAL	BENDING SPACE	
MODEL 1 PHASE		MODEL 3 PHASES											
200-208V	220-240V	200-208V	220-240V	380-416V	440-480V	550-600V	LINE TERMINALS	MAXIMUM (*) WIRE SIZE	LINE TERMINALS	MAXIMUM (*) WIRE SIZE		INCH	mm
7.5	7.5	15	15	30	30	30	10 to 1/0 AWG	1 AWG	10 to 1/0 AWG	1 AWG	14 to 1/0 AWG	3	76
15	15	25	30	-	-	-	10 to 1/0 AWG	1 AWG	3 to 3/0 AWG	1 AWG	14 to 1/0 AWG	3	76
-	-	30	-	-	-	-	10 to 1/0 AWG	1 AWG	14 to 1/0 AWG	1 AWG	14 to 1/0 AWG	3	76

(*) : Maximun wiring size only for wire entering the cabinet in wall opposite the terminals.
For wires entering from others walls use maximum line terminal capacities.
(**) : Ground terminal suitable for service entrance bounding & grounding, when accepted by authority having jurisdiction.