10/25/11

Attn: Jerry Kingery and Ken Laber

Project Name: TMWRF – Influent & Effluent Pumps
Project Number:
Specification Number:

Dear Jerry

Thank you for the opportunity to provide you a proposal for this project. Enclosed please find the quotation and submittal documents for the project identified above.

We appreciate your continued interest in ABB Products. Please feel free to contact me with any questions you have regarding the information provided.

Sincerely,

Carl Wojtkowiak

solutions
Intec
27 Glen Carran Cir
Sparks, NV 89431
775-356-0222

Project Quotation for TMWRF - Inffluent& Effluent

Project Number:

Specification:

Engineering Contact:

Contractor:

Architect:

End Customer (User): City of Sparks TMWRF

Submitted By: Carl Wojtkowiak, Intec Solutions

Revision:

Date:

Quotation Schedule

This schedule includes the products supplied as part of this quotation.

Item	Qty	Tag / Equipment ID	Product ID	Description	Price (Ext. Net)
1	2		ACS800-37-0260-5+B054+C129+H352+K466+L501+L504+8L506	ACS800 Drive Cabinet Drive (Ultra Low Harmonic). Input Voltage 480 VAC. 302A ND, 226A HD. NEMA 1 Filtered - IP42. Frame Size -R8i	$36900.00/e
2	2		ACS800-37-0510-5+B054+C129+K466+L501+L504+P902	ACS800 Drive Cabinet Drive (Ultra Low Harmonic). Input Voltage 480 VAC. 571A ND, 445A HD. NEMA 1 Filtered - IP42. Frame Size -R8i	$54900.00/e

Terms:

- *FOB ABB Factory*
- *Proposal valid for 30 date from quotation date*
- *ABB Inc. Standard Terms and Conditions of Sale apply*
- *Proposal based upon acceptance of Clarifications and Exceptions to Specifications and Terms provide later in this quotation*

End User Sub-Total
$183,600.00
Freight (estimated):
$4000.00

Submittal Schedule

This schedule includes the products supplied as part of this submittal.

Schedule			Motor Data[1]			Drive Data			
Item	Qty	Tag / Equipment ID	HP	FLA	Voltage	Product ID	HP	Output Amps	Voltage
1	2		250	302	460 VAC	ACS800-37-0260-5+B054+C129+H352+K466+L501+L504+8L506	250	302	480 VAC
2	2		450	515	460 VAC	ACS800-37-0510-5+B054+C129+K466+L501+L504+P902	450	571	480 VAC

Notes: 1. AC Motor Data is per National Electrical Code Table 430.250 for typical motors used in most applications and is provided as typical data only. DC motor data is per typical industry standards. Actual motor data may vary.

Clarifications and Exceptions to Specification and Terms

The comments and clarifications that follow are offered in response to the specification items identified below. Please refer to the specification section and paragraph indicated. Any contract executed based on this proposal is done based acceptance of the exceptions noted herein.

Item ID	Title	Clarifications and Exceptions

Submittal Schedule Details for

Item	Tag / Equipment ID	Product ID
1		ACS800-37-0260-5+B054+C129+H352+K466+L501+L504+8L506

Item Description
Input Voltage: 480 VAC **Rated Output Current:** 302 AMPS 110% 1 min - Normal Duty **Construction:** Cabinet Drive (Ultra Low Harmonic) **Enclosure:** NEMA 1 Filtered - IP42 **Nominal Horsepower:** 250 **Frame Size:** R8i **Input Disconnecting Means:** Fusible Disconnect Switch **Bypass:** None **Input Impedance:** 10% LCL High frequency filter **Short Circuit Current Rating:** **Communication Protocols:** EtherNet IP/Modbus/TCP Adapter **Other Options:** Common Mode Filter - Included, EMC/RFI Filter 2nd Envir. - Included, Coated Boards - Included, 115VAC aux ctrl voltage, US conduit plate, Load Switch, Fuses, Top Entry & Bottom Exit-UL Approved-Included, Additional I/O TB, PT100 Relay (8),

Drive Input Fuse Ratings[1]	
Amps (600 V)	**Bussmann Type**
450	170M5059

Wire Size Capacities of Power Terminals				
Circuit Breaker	**Disconnect Switch**	**Terminal Block**	**Overload Relay**	**Ground Lug**
N/A N/A	N/A	up to 3 x 500 MCM 52 ft-lb 3 x 2 busbar holes, 1.75" spacing, 1/2" bolts	N/A	up to 3 x 500 MCM 52 ft-lb

Dimensions and Weights				
Height in / mm	**Width in / mm**	**Depth in / mm**	**Weight lbs / kg**	**Dimension Drawing**
83.9 / 2130	48.5 / 1230	25.4 / 644	2646 / 1200	68503272sheet 9

Heat Dissipation & Airflow Requirements			
Power Losses		**Airflow**	
Watts	**BTU/Hr**	**CFM**	**CM/Hr**
8995	30700	1860	3161

Reference Drawings		
Power Wiring	**Connection Diagram**	**Dimension Detail**
68585724 sheet 211	68585724 sheet 217 68585724 sheet 219 68585724 sheet 216, 68585724 sheet 222,	68503272sheet 9

Submittal Schedule Details for

Item	Tag / Equipment ID	Product ID
2		ACS800-37-0510-5+B054+C129+K466+L501+L504+P902

Item Description
Input Voltage: 480 VAC **Rated Output Current:** 571 AMPS 110% 1 min - Normal Duty **Construction:** Cabinet Drive (Ultra Low Harmonic) **Enclosure:** NEMA 1 Filtered - IP42 **Nominal Horsepower:** 450 **Frame Size:** R8i **Input Disconnecting Means:** Fusible Disconnect Switch **Bypass:** None **Input Impedance:** 10% LCL High frequency filter **Short Circuit Current Rating:** **Communication Protocols:** EtherNet IP/Modbus/TCP Adapter **Other Options:** Common Mode Filter - Included, EMC/RFI Filter 2nd Envir. - Included, Coated Boards - Included, 115VAC aux ctrl voltage, US conduit plate, Load Switch, Fuses, Top Entry & Exit-UL Approved-Included, Additional I/O TB, PT100 Relay (10),

Drive Input Fuse Ratings[1]	
Amps (600 V)	**Bussmann Type**
1000	170M6214

Wire Size Capacities of Power Terminals				
Circuit Breaker	**Disconnect Switch**	**Terminal Block**	**Overload Relay**	**Ground Lug**
N/A N/A	N/A	up to 3 x 500 MCM 52 ft-lb 3 x 2 busbar holes, 1.75" spacing, 1/2" bolts	N/A	up to 3 x 500 MCM 52 ft-lb

Dimensions and Weights				
Height in / mm	**Width in / mm**	**Depth in / mm**	**Weight lbs / kg**	**Dimension Drawing**
83.9 / 2130	48.5 / 1230	25.4 / 644	2646 / 1200	68503272sheet 9

Heat Dissipation & Airflow Requirements			
Power Losses		**Airflow**	
Watts	**BTU/Hr**	**CFM**	**CM/Hr**
18020	61500	1860	3161

Reference Drawings		
Power Wiring	**Connection Diagram**	**Dimension Detail**
68585724 sheet 211	68585724 sheet 217 68585724 sheet 219 68585724 sheet 216, 68585724 sheet 222,	68503272sheet 9

ACS800 Ultra Low Harmonic Product Overview

Description

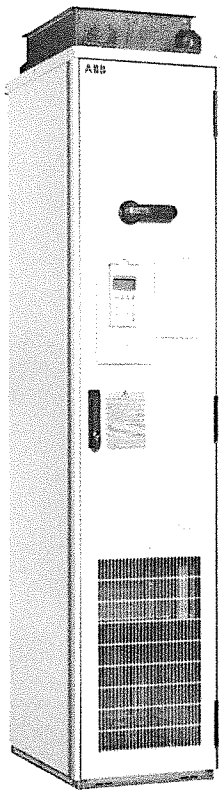
The ACS800 Ultra Low Harmonic (ULH) drive series is a microprocessor based Direct Torque Controlled (DTC) adjustable speed AC drive. The ACS800 ULH drive takes advantage of sophisticated microprocessor control and advanced IGBT power switching technology to deliver high-performance control of AC motors for a wide range of applications.

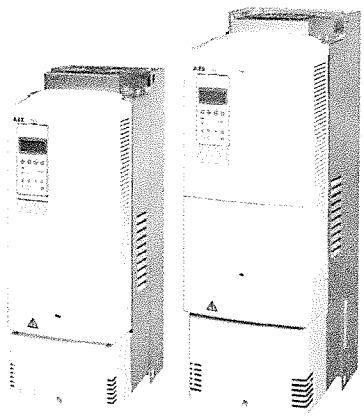
In the ACS800 ULH drive the solution for harmonics mitigation is incorporated into the drive. The drive is equipped with an active, controlled supply unit and low harmonic line filter instead of conventional diode bridge supply. The result is exceptionally low line harmonic content meeting IEEE 519 at the drive's input terminals. The ACS800 ULH drive meets IEEE 519 at terminals with even 3% line imbalance. Consequently, the ACS800 ULH drive does not require 18-pulse transformer or additional external input filter for harmonic mitigation, and is thus simple, compact solution for the drive installations where low harmonic content is required.

The ACS800 ULH drive is available as wall mounted drive (type ACS800-U31) in power range from 10 to 125 Hp and as cabinet-built drive (type ACS800-37) in power range from 75 to 2800 Hp.

With drives ranging from 10 to 2800 HP, the ACS800 ULH series features a universal alphanumeric interface that "speaks" to the operator in plain English phrases, greatly simplifying set-up, operation, and fault diagnosis. The interface also provides an intelligent start-up assistant that actively guides the operator through the start-up procedure. The ACS800 ULH is programmable in fourteen languages.

Each ACS800 ULH drive comes equipped with inbuilt, pre-programmed application macros for rapid configuration of inputs, outputs, and performance parameters. In addition to this, the ACS800 ULH drive provides a possibility for function block programming as standard with its 15 programmable function blocks. The ACS800 ULH series can handle the most demanding commercial applications in an efficient, dependable, and economic manner.





ACS800 ULH Standard Features

- UL, cUL labeled (-37 with option selection) and CE marked
- EMI/RFI Filter (2nd Environment) (-37, optional in -U31)
- Input Fuses and Disconnect (-37)
- Intelligent Start-Up Assistants
- Operator Panel Parameter Backup (read/write)
- 4 line by 20 Character Multilingual Alphanumeric Display for Operator Control, Parameter Set-Up and Operating Data Display (examples):
  - Output Frequency (Hz)
  - Speed (RPM)
  - Motor Current
  - Calculated % Motor Torque
  - Calculated Motor Power (kW)
  - DC bus Voltage
  - Output Voltage
  - Heatsink Temperature
  - Elapsed Time Meter (reset-able)
  - KWh (reset-able)
  - Fault Text
  - Warning Text
- Adaptive Programming with fifteen (15) logic controller type function blocks
- Three (3) programmable Analog Inputs
- Seven (7) Digital inputs, (6) Programmable & (1) dedicated Start Interlock
- Two (2) programmable Analog Outputs
- Three (3) Programmable Form C Relay Outputs
- Adjustable filters on Analog inputs and outputs
- Mathematical Functions on Analog Reference Signals
- All Control Inputs Isolated from Ground and Power as Groups
- Fibre Optic Interface RDCO-03
- Input Speed Signals
  - Two (2) Current 0 (4) - 20 mA
  - One (1) Voltage +/- 0 (2)- 10VDC
  - Increase/Decrease reference Contacts
  - Serial Communications
- Start/Stop
  - 2 wire control (dry contact closure)
  - 3 wire control (momentary dry contacts)
  - Serial Communications
- Start Functions
  - Ramp
  - Flying Start
  - Premagnetization on Start
  - Automatic Torque Boost
  - Automatic Torque Boost with Flying Start
  - Auto Restart (Reset) – Customer Selectable and Adjustable
- Stop Functions
  - Ramp or Coast to Stop
  - Emergency Stop
  - DC Braking / Hold at Stop
  - Flux Braking
- Accel/Decel
  - Two (2) sets of Independently Ramps
  - Linear or Adjustable 'S' Curve Accel/Decel Ramps
- Fifteen (15) Preset Speeds
- Three (3) Critical Speed Lockout Bands
- Electronic Reverse
- Self-Tuning speed controller
- Maximum Frequency Programmable up to 300 Hz
- Reference Trim
- Master/Follower
- Supervision Functions
- Adjustable Current Limit
- Adjustable Torque Limit
- Automatic Extended Power Loss Ride Through (Selectable)
- Integral Programmable PID Setpoint Controller
- Preprogrammed Protection Circuits
  - Overcurrent
  - Short Circuit
  - Overvoltage
  - Undervoltage
  - Input Phase Loss
  - Ambient temperature
  - Output Device (IGBT) Overtemperature
  - Internal Fault
  - Overfrequency
  - UL508C approved Electronic Motor Overload (I^2T)
- Programmable Fault Functions for Protection Include
  - Loss of Analog Input
  - Panel Loss
  - External Fault
  - Motor Thermal Protection
  - Stall
  - Underload
  - Motor Phase Loss
  - Ground Fault
  - Communications Fault
  - Supervision of optional I/O
- Adjustable Current Limit
- Adjustable Torque Limit
- Inbuilt harmonic mitigation
  - Active Supply Unit
  - Low harmonic line filter (LCL type)

OPTIONAL FEATURES

- I/O Extension Options
  - Analog I/O Extension RAIO-01
  - Digital I/O Extension RDIO-01
  - Pulse Encoder Interface RTAC-03
- Seven (7) Serial Communication Protocols
  - DeviceNet
  - LONWorks
  - Profibus-DP
  - CANOpen
  - Modbus
  - ControlNet
  - Ethernet
  - NBAA
  - Johnson Controls Incorporated (JCI) Metasys N2
  - Siemens Building Technologies (SBT) Apogee FLN
- EMC/RFI Filters (1st and 2nd Environments) (Note! 2nd Environment filter as standard in -37)
- Dynamic Braking Choppers
- DriveWindow® - a Start-up and Programming Tool
- Windows® based Adaptive Programming Tool

ACS800 ULH Specifications

Input Connection

Input Voltage (U_1)	208/220/230/240Vac 3-phase +/-10% (ACS800-U31)
	380/400/415/440/460/480/500Vac 3-phase +/-10%
	525/575/600/690Vac 3-phase +/-10%
Frequency:	48 - 63 Hz
Line Limitations:	Max +/-3% of nominal phase to phase input voltage
Fundamental Power Factor (cos φ):	1.0
Connection:	U_1, V_1, W_1
Output (Motor) Connection	
Output Voltage:	0 to U1, 3-phase symmetrical, UN at the field weakening
Output Frequency:	-300 to +300 Hz, in DTC mode (0-3.2((U1 input voltage/UN motor)*fN motor))with dU/dT choke limited 120Hz
Frequency Resolution:	0.01 Hz
Continuous Output Current:	1.0 * I2N (normal use)
	1.0* I2hd (heavy-duty use)
Short Term Overload Capacity	INmax = 1.1 * I2N (1 min / 5 minutes @ 40°C), typical Ihdmax = 1.5 * I2hd (at least 1 min / 5 min @ 40°C)
Peak Overload Capacity	Imax (400 Vac and 500 Vac) (at least 10 seconds at start)
Field Weakening Point	8 to 300 Hz
Switching Frequency	3 kHz (average), DTC dynamically varies from 1 to 12kHz
Acceleration & Deceleration Time	0.00 to 1800 Sec
Efficiency	97% at nominal power level
Short circuit withstand rating	65,000 AIC (UL) R2-R8; U31 = 65ka; 37 = 100ka
Connection	U2, V2, W2
Enclosure	
Style:	UL (NEMA) Type 1 or Type 12 (ACS800-37 only)
Agency Approval	
Listing and Compliance:	UL, cUL, CE

Ambient Conditions, Operation

Air Temperature	0° to 40°C (104°F), above 40°C the maximum output current is Current is de-rated 1% for every additional 1°C (up to 50°C) (122°F) maximum limit)
Relative Humidity	5 to 95%, no condensation allowed, maximum relative humidity is 60% in the presence of corrosive gasses
Contamination Levels	
IEC	60721-3-1, 60721-3-2 and 60721-3-3
Chemical Gasses	3C1 (w/o coating), 3C2 (with coating)
Solid Particles	3S2
Installation Site Altitude	0 to 1000m (3300ft) above sea level. At sites over 1000m (3300ft) above sea level, the maximum power is de-rated 1% for every additional 100m (330ft). If the installation site is higher than 2000m (6600ft) above sea level, please contact your local ABB distributor or representative for further information.
Vibration Max	1mm (0.04") 5 to 13.2 Hz, Max 7 m/s2 (23 ft/s2) 13.2 to 100 Hz sinusoidal

Ambient Conditions, Storage and Transportation (in Protective Shipping Package)

Air Temperature	-20° to 70°C (-4° to 158°F)
Relative Humidity	Less than 95%, no condensation allowed
Atmospheric Pressure	70 to 106 kPa (10.2 to 15.4 PSI)
Vibration Max	1mm (0.04") 5 to 13.2 Hz, Max 7 m/s2 (23 ft/s2) 13.2 to 100 Hz
Shock (IEC 60068-2-29)	Max 100 m/s2 (330 ft/s2) 11 ms
Free Fall	250mm for weight less than 100Kg / 100mm for weight greater than 100Kg

ACS800 ULH Specifications (continued)

Analog Inputs

Three (3) Programmable Differential Inputs

Two (2) Current Signals	0 (4) to 20 mA, Input Resistance RI = 100 ohms
One (1) Voltage Signal	-10Vdc / 0(2) to +10Vdc, Input Resistance RI = 200 k-ohms
Common Mode Voltage	+/-15 Vdc, max.
Common Mode Rejection Ratio	> 60 dB at 50 Hz
Resolution	0.025% (12 bit)
Accuracy	+/- 0.5%
Input Updating Time	6 ms (Standard Application Software)
Optional Isolation	Available through optional external module

Reference Power Supply

Voltage	+10Vdc, 0, -10Vdc +/- 0.5% at 25° C (77° F)
Maximum Load	10 mA
Applicable Potentiometer	1 k-ohm to 10 k-ohm

Analog Outputs

Two (2) Programmable Current Outputs

Signal Level	0 (4) to 20 mA
Resolution	0.025% (12 bit)
Accuracy	+/-1% Full Scale Range at 25°C (77°F)
Maximum Load Impedance	700 ohms
Output Updating Time	24 ms (Standard Application Software)

Digital Inputs

Six (6) Programmable Digital Inputs (Common Ground), plus One (1) Start Interlock

Isolation	Isolated, can be divided in two isolated groups
Isolation Test Voltage	500 VAC, 1 minute
Signal Level	24Vdc, -15% to +20%
Logical switch thresholds	< 8Vdc at "0", >12Vdc at "1"
Input Current	10 mA, Digital Input 1 to Digital Input 5, 5 mA Digital Input 6
Filtering Time Constant	1 ms
Input Updating Time	6 ms (Standard Application Software)

Internal 24 Vdc Supply for Digital Inputs

Voltage	24Vdc
Maximum Current	100 mA
Connector	X22:7
Protection	Short Circuit Proof

An external 24 Vdc supply may be used instead of the internal supply

Relay Outputs

Three Programmable Relay Outputs

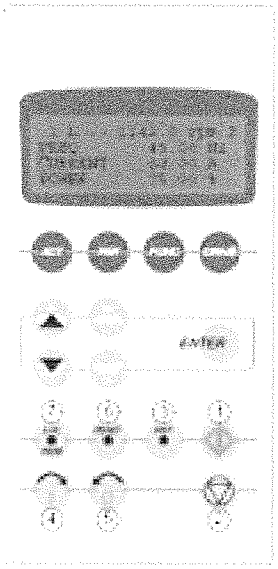
Switching Capacity	8 A at 24Vdc or 250Vac, 0.4 A at 120Vdc
Maximum Continuous Current	IC = 2 Amps RMS
Contact Material	Silver Cadmium Oxide (AgCdO)
Isolation Test Voltage	4 kVac, 1 minute
Output Updating Time	100 ms (Standard Application Software)

Protections

Single Phase	Protected (input & output)
Over Voltage Trip Limit	1.3 * U1max
Under Voltage Trip Limit	0.65 * U1min
Over Temperature	Protected
Auxiliary Voltage	Short Circuit Protected
Ground Fault	Protected
Microprocessor Fault	Protected
Motor Stall Protection	Protected
Motor Over Temperature	Protected (I2t)

Specifications are subject to change without notice. Please consult the factory when specifications are critical.

ACS800 ULH Control Panel



The LCD type display has 4 lines of 20 characters.
The language is selected at start-up (parameter 99.01).
The control panel has four operation modes:

- Actual Signal Display Mode (ACT key)
- Parameter Mode (PAR key)
- Function Mode (FUNC key)
- Drive Selection Mode (DRIVE key)

The use of single arrow keys, double arrow keys and ENTER depend on the operation mode of the panel.

No.	Use
1	Start
2	Stop
3	Activate reference setting
4	Forward direction of rotation
5	Reverse direction of rotation
6	Fault reset
7	Change between Local/Remote Control

Control Modes

Drive control with the panel
The user can control the drive with the panel as follows:

- start, stop, and change direction of the motor
- give the motor speed reference or torque reference
- give a process reference (when the process PID control is active)
- reset the fault and warning messages
- change between local and external drive control.

The panel can be used for control of the drive control always when the drive is under local control and the status row is visible on the display.

Actual signal display mode
In the Actual Signal Display Mode, the user can:

- show three actual signals on the display at a time
- select the actual signals to display
- view the fault history
- reset the fault history.

The panel enters the Actual Signal Display Mode when the user presses the ACT key, or if he does not press any key within one minute.

Parameter mode
In the Parameter Mode, the user can:

- view the parameter values
- change the parameter settings.

Control Modes (continued)

The panel enters the Parameter Mode when the user presses the PAR key.

Function mode

In the Function Mode, the user can:

- start a guided procedure for adjusting the drive settings (assistants)
- upload the drive parameter values and motor data from the drive to the panel.
- download group 1 to 97 parameter values from the panel to the drive. 1)
- adjust the contrast of the display.

The panel enters the Function Mode when the user presses the FUNC key.

Cable Connections

Terminal	Description	Note
U1, V1, W1	3~ power supply input	
L1, L2, L3	3~ power supply input	
PE / GND	Protective Ground	Follow local rules for cable size.
U2, V2, W2	Power output to motor	
Uc+, Uc-	DC bus	Not accessible in ACS800-37
X20 to X23	Control Wiring	Low voltage control – Use shielded cable
X25 to X27	Control Wiring	Low voltage or 115VAC

Follow local codes for cable size. To avoid electromagnetic interference, use separate metallic conduits for input power wiring, motor wiring, control and communications wiring. Keep these four classes of wiring separated in situations where the wiring is not enclosed in metallic conduit. Also, keep 115VAC control wiring separated from low voltage control wiring and power wiring.
Use shielded cable for control wiring.

Ampacity is based on the use of 60 °C rated power cable up to 100 Amps (75 °C over 100 Amps).

Refer to the included tables for current ratings, fuse recommendations and maximum wire size capacities and tightening torques for the terminals. The ACS800 ULH drive is suitable for use on a circuit capable of delivering not more than 100,000 RMS symmetrical amperes, 600V maximum. The ACS800 ULH has an electronic motor protection feature that complies with the requirements of the National Electric Code (NEC) 430.126(A)(2). When this feature is selected and properly adjusted. Additional overload protection is not required unless more than one motor is connected to the drive or unless additional protection is required by applicable safety regulations.

For CE installation requirements, see ABB publication CE-US-02 "CE Council Directives and Variable Speed Drives." Contact your local ABB representative for specific IEC installation instructions.

ACS800 Control Terminals

X20	Identification	Description
1	VREF-	Reference voltage -10 VDC, 1 kohm ≤RL ≤ 10 kohm
2	AGND	
X21	Identification	Description
1	VREF+	Reference voltage 10 VDC, 1 kohm ≤RL ≤ 10 kohm
2	AGND	
3	AI1+	Speed reference 0(2) .. 10 V, Rin > 200 kohm
4	AI1-	
5	AI2+	By default, not in use. 0(4) ... 20 mA, Rin = 100 ohm
6	AI2-	
7	AI3+	By default, not in use. 0(4) ... 20 mA, Rin = 100 ohm
8	AI3-	
9	AO1+	Motor spped 0(4) ... 20 mA = 0...motor Nom. speed, RL < 700 ohm
10	AO1-	
11	AO2+	
12	AO2-	
X22	Identification	Description
1	DI1	Start ( )
2	DI2	Stop ( )
3	DI3	Forward/Reverse 1)
4	DI4	Acceleration & deceleration select 2)
5	DI5	Acceleration & deceleration select 2)
6	DI6	Constant speed select 3)
7	+24VD	+24 VDC max. 100 mA
8	+24VD	
9	DGND1	Digital ground
10	DGND2	Digital ground
11	DIIL	Start interlock (0 = stop) 4)
X23	Identification	Description
1	+24V	Auxiliary voltage output, non-isolated, 24 VDC 250 mA
2	GND	
X25	Identification	Description
1	RO1	Relay output 1: ready
2	RO1	
3	RO1	
X26	Identification	Description
1	RO2	
2	RO2	Relay output 2: running
3	RO2	
X27	Identification	Description
1	RO3	
2	RO3	Relay output 3: fault (-1)
3	RO3	

Notes:

1) **Only effective if par. 10.03 is set to REQUEST by the user.**

2) **0 = open, 1 = closed**
DI4.....Ramp times according to
0.....parameters 22.02 and 22.03
1 .....parameters 22.04 and 22.05

3) **See par. group 12 CONSTANT SPEEDS.**

DI5	DI6	Operation
1	0	Constant speed 1
0	1	Constant speed 2
1	1	Constant speed 3

4) **See parameter 21.09 START**

Cabinet-built Drive Standard Features

ACS800 ULH Cabinet-built Drive – Overview

The cabinet-built drive is ACS800 ULH drive in an integrated UL Type 1 or UL Type 12 enclosure with an input disconnect switch, fuses and either contactor or circuit breaker (depending on power rating of the drive). The enclosure is of floor standing type.

The ACS800 ULH cabinet-built drive provides an input disconnect switch or circuit breaker with door mounted, interlocked operator (padlockable in the OFF position), a local operator keypad with indicating lights, and provisions for optional auxiliary devices and for external control connections.

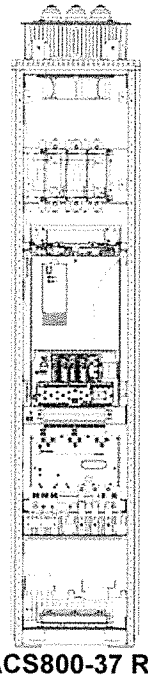
Cable Connections

The ACS800 ULH cabinet-built drive series consists of eight different frame sizes according to power rating. The following illustrations show the main component location and cable connection points for the various frame sizes. The illustrations indicate the location of input and output power connections as well as equipment placement inside the enclosure. The frame sizes covering power range below 500 Hp are shown here, for high power units please see the detailed dimensional drawing.

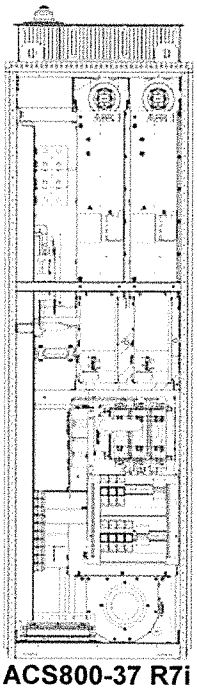
The ACS800 ULH cabinet-built drives are configured for cabling and wiring access from the top as standard. At least three separate metallic conduits are required, one for input power, one for output power to the motor and one for control signals. Configuration for the access from bottom is available as a separately ordered option (requires selection by option code).

Terminal Sizes

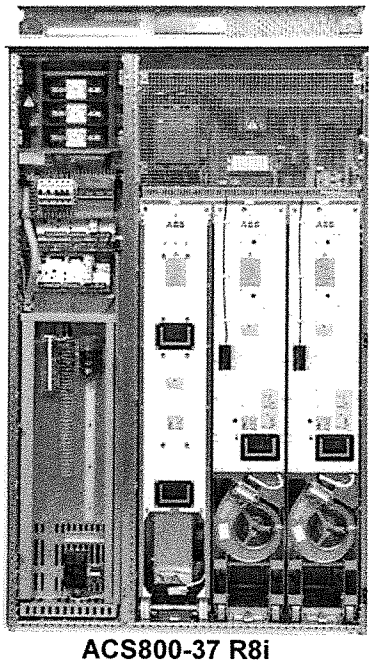
Power and motor cable terminal sizes are shown in the *Submittal Schedule Details* and in the *Wire Size Capacities of Power Terminals* Table. The table also lists torque that should be applied when tightening the connections.



ACS800-37 R6



ACS800-37 R7i



ACS800-37 R8i