



A Cryogenic Industries Company

# **COSMODYNE**

## **PACKAGED PLANTS**

### **ELM 100-600**

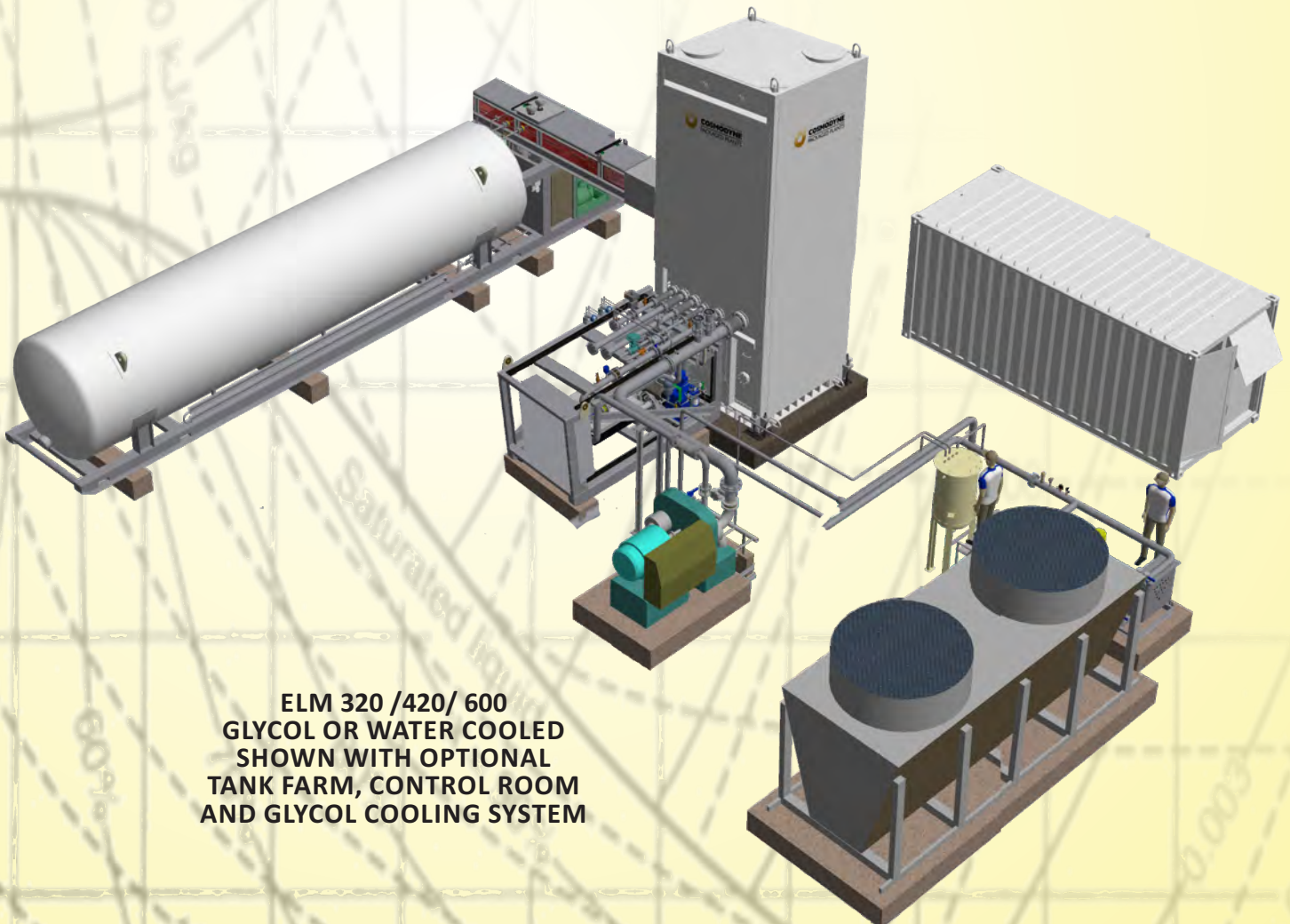
#### **PRODUCT CATALOGUE**

##### **O<sub>2</sub>/N<sub>2</sub>/AR LIQUEFIERS**

The ELM is designed to maximise Nitrogen purity and recovery. The ELM plants are designed specifically to meet the challenge of ever-increasing global power and fuel costs while maintaining the high reliability and mobility of a modular design that is container shipable.

This innovative plant is built to meet the highest industrial gas safety and quality standards to ensure flawless and reliable performance under the most severe operating conditions.

Structurally ideal for emerging markets and remote locations, the ELM plants' phenomenal efficiency makes it equally suitable for more long-term production applications.



**ELM 320 /420/ 600  
GLYCOL OR WATER COOLED  
SHOWN WITH OPTIONAL  
TANK FARM, CONTROL ROOM  
AND GLYCOL COOLING SYSTEM**

# ELM SERIES 100-600

## ELM O<sub>2</sub>/N<sub>2</sub>/AR LIQUEFIERS

Barometric Press	14.7	psia
Dry bulb	26	°C
RH, %	70	%
Wet Bulb	22.72	°C
Cooling water	29	°C

Nm<sup>3</sup>/hr defined at 0°C 1 Atms  
 Multiple different split modes are possible  
 Outlet product temperature= saturated liquid at pressure  
 Oxygen/argon liquefier can also produce N<sub>2</sub> liquid in any split mode

		NITROGEN				ARGON		OXYGEN			
FEED TEMPERATURE		36				36		36			°C
FEED PURITY		5ppm O <sub>2</sub>				99.995% ARGON		99.6% O <sub>2</sub>			
FEED PRESSURE		5 Min	6	8	16 Max	4 Min	16 Max	0.5 Min	5	16 Max	BARG
ELM100	PRODUCTION	3.1	3.2	3.3	3.8	4.5	6.6	3.2	3.4	3.83-	METRIC TON/DAY
		102	107	110	127	105	154	93	100	112	Nm <sup>3</sup> /hr
	POWER	112	112	112	112	112	112	112	112	112	KW
	SPECIFIC POWER	1.10	1.05	1.01	0.89	1.06	0.72	1.20	1.11	1.00	Kwh/Nm <sup>3</sup>
ELM130	PRODUCTION	3.9	3.96	4.05	4.4	5.6	7.9	3.8	4.2	5.0	METRIC TON/DAY
		130	132	135	146	131	185	111	121	146	Nm <sup>3</sup> /hr
	POWER	134	134	134	134	134	134	134	134	134	KW
	SPECIFIC POWER	1.03	1.01	0.99	0.91	1.02	0.72	1.20	1.11	0.91	Kwh/Nm <sup>3</sup>

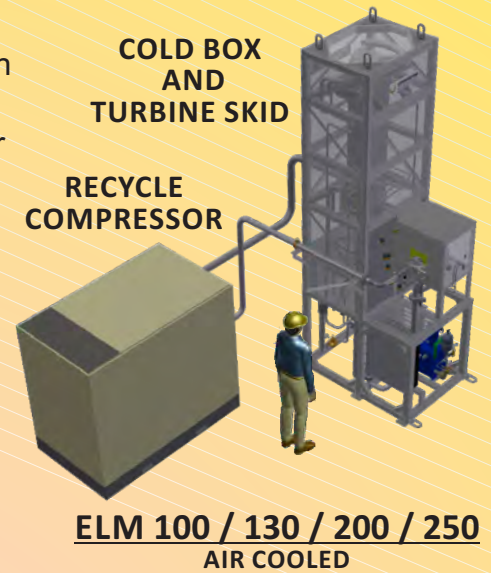
		NITROGEN				ARGON		OXYGEN			
C995 TEMPERATURE		36				36		36			°C
FEED PURITY		5ppm O <sub>2</sub>				99.995% ARGON		99.6% O <sub>2</sub>			
FEED PRESSURE		0.03 Min	7.0		16 Max	4 Min	16 Max	0.5 Min	5	16 Max	BARG
ELM200	PRODUCTION	6.6	7.3		8.6	8.2	13.5	6.1	8.2	9.7	METRIC TON/DAY
		219	255		286	192	315	212	238	282	Nm <sup>3</sup> /hr
	POWER	237	237		237	237	237	237	237	237	KW
	SPECIFIC POWER	1.08	0.93		0.83	1.24	0.75	1.12	1.00	0.84	Kwh/Nm <sup>3</sup>
ELM320	PRODUCTION	8.8	9.8		11.5	11.0	18.1	8.2	10.9	13.0	METRIC TON/DAY
		280	326		365	245	403	271	304	360	Nm <sup>3</sup> /hr
	POWER	304	304		304	304	304	304	304	304	KW
	SPECIFIC POWER	1.08	0.93		0.83	1.24	0.75	1.12	1.00	0.84	Kwh/Nm <sup>3</sup>
ELM420	PRODUCTION	12.3	13.1		15.4	15	24	10.9	14.6	17.3	METRIC TON/DAY
		390	436		489	328	539	363	406	482	Nm <sup>3</sup> /hr
	POWER	410	410		410.0	410	410	410	410	410	KW
	SPECIFIC POWER	1.05	0.94		0.84	1.25	0.76	1.13	1.01	0.85	Kwh/Nm <sup>3</sup>
ELM500	PRODUCTION	15.3	15.3		18.0	17	28	15.2	17.1	20.2	METRIC TON/DAY
		500	500		560	376	618	477	466	552	Nm <sup>3</sup> /hr
	POWER	525	465		465.0	465	465	525	465	465	KW
	SPECIFIC POWER	1.05	0.93		0.83	1.24	0.75	1.10	1.00	0.84	Kwh/Nm <sup>3</sup>
ELM600	PRODUCTION	17.5	19.9		23.4	22	37	16.6	22.2	21.1	METRIC TON/DAY
		583	662		741	498	818	550	617	617	Nm <sup>3</sup> /hr
	POWER	577	577		577.2	577	577	577	577	497	KW
	SPECIFIC POWER	0.99	0.87		0.78	1.16	0.71	1.05	0.94	0.81	Kwh/Nm <sup>3</sup>



## ELM O<sub>2</sub>/N<sub>2</sub>/AR LIQUEFIERS

**Oxygen, Nitrogen or Argon Liquefier.** The Oxygen and Argon Liquefiers has an independent Nitrogen refrigeration loop, The Oxygen liquefier can seamlessly make both Liquid Nitrogen and Oxygen in any split, and can act as a pipeline skimmer, when the pipeline demand is high the liquefier will produce Liquid Nitrogen instead of Oxygen.

The Plant is highly packaged with a modular design that is container shippable, This innovative plant is built to meet the highest industrial gas safety and quality standards to ensure flawless and reliable performance under the most severe operating conditions.



### Standard Equipment and Features

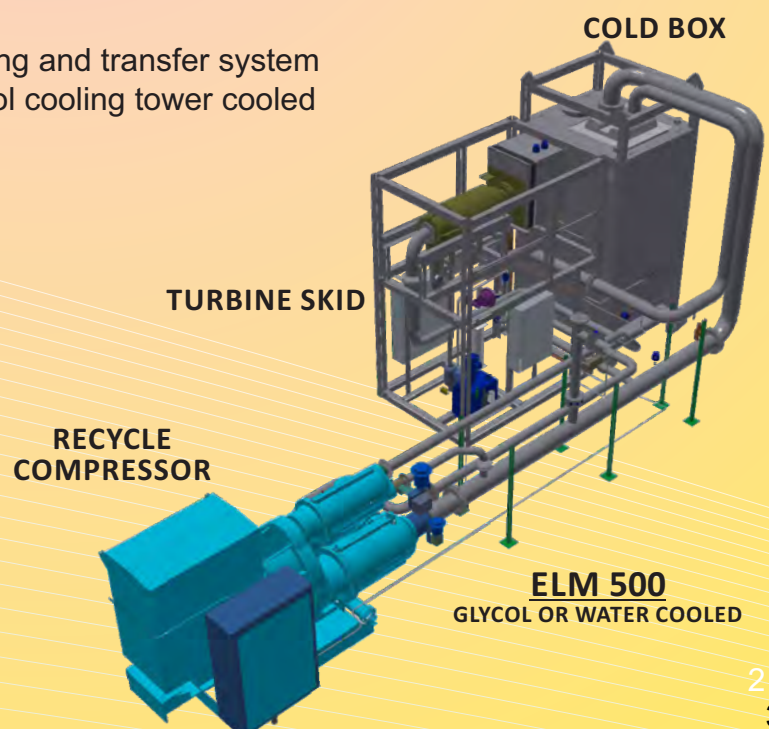
- High-performance ACD low bearing loss roller element bearing turbo expander
- Cartridge-style rotating element for easy removal and installation
- Roller element bearings allow excellent loss-of-power protection for rundown: ideal for unreliable power
- Efficient, reliable oil free centrifugal or dry screw compressors
- Ships as three standard ISO containers to minimize transportation expense
- Complete with all interconnecting piping and electrical systems, ready for installation
- State of the art control system
- Designed to allow unattended night shift operation, remote optimization, problem solving
- Remote start-up as well as un-attended startup
- Siemens S7 PLC Fully automatic digital process-control system with PC Based HMI with touch screen
- Choice of 50 or 60 Hz power systems

### Options and Accessories

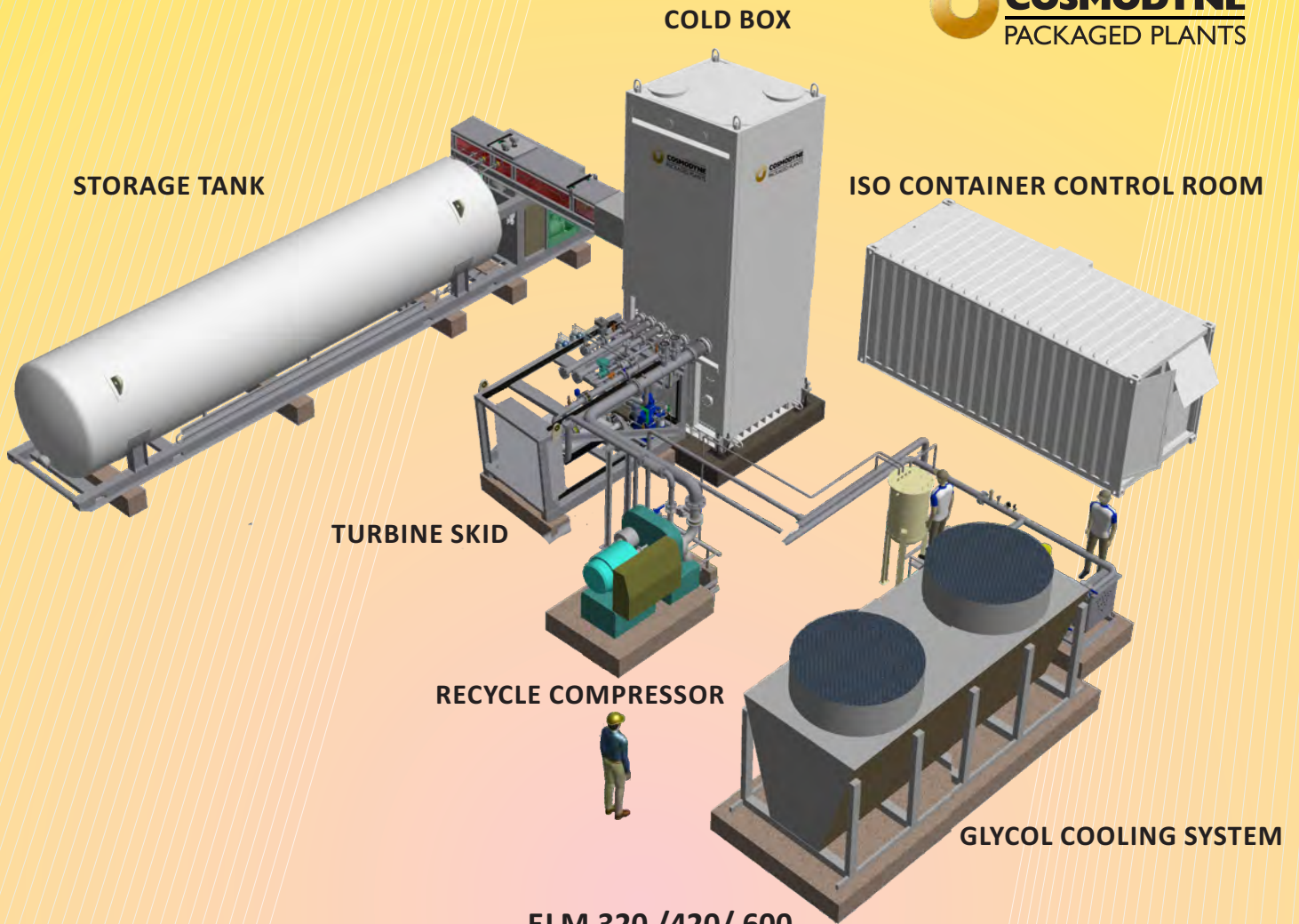
- CE compliance
- Dual product options available
- Factory cold performance Test
- ISO container Control Room
- Integrated product storage, high pressure pumping and transfer system
- Air cooled, evaporative water cooled or dry glycol cooling tower cooled



ELM500 ASSEMBLY







**ELM 320 /420/ 600**

GLYCOL OR WATER COOLED

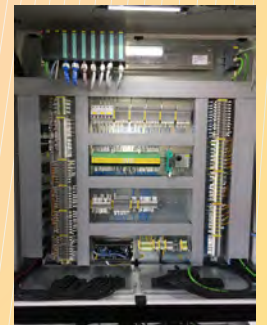
SHOWN WITH OPTIONAL TANK FARM, CONTROL ROOM AND GLYCOL COOLING SYSTEM



TURBINE SKID



POWER PANEL



PLC PANEL



ACD TURBINE WITH LUBE OIL AND SEAL GAS SYSTEMS

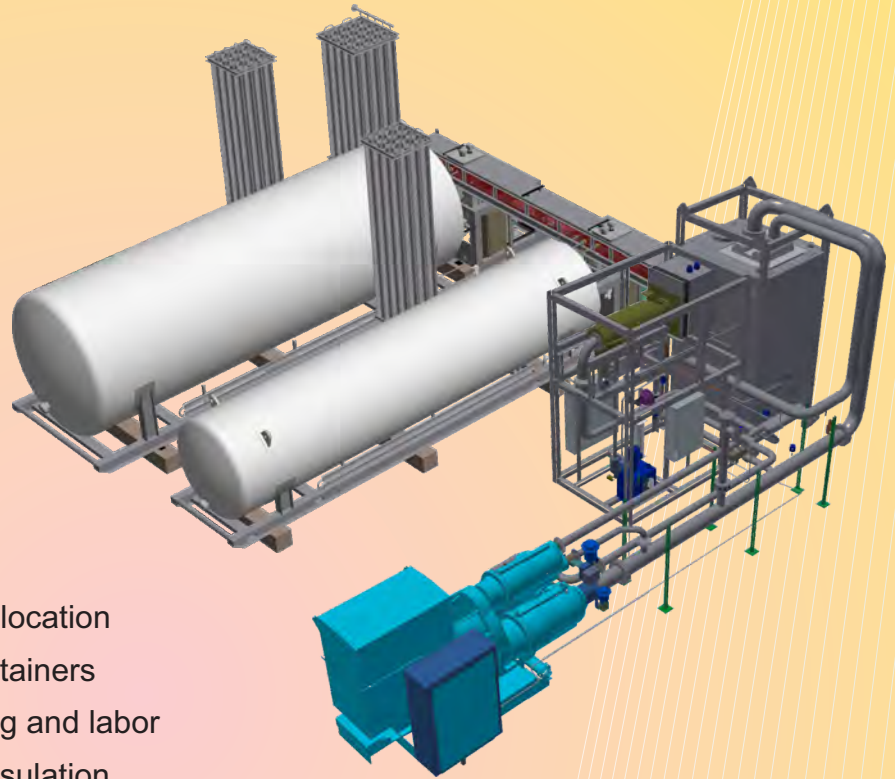


BRAZED AL HEAT EXCHANGER AND PIPING



Cosmodyne Packaged Plants offers a liquid storage, pumping and cylinder filling solutions. The innovative, skid-mounted system is engineered for the safe and efficient storage of liquid Oxygen and liquid Nitrogen in low pressure horizontal tanks. The package facilitates remote process monitoring, automatic pump cool-down and loss of prime protection, inventory control, liquid pump transfer to road tankers, high pressure pumping and vaporization for cylinder filling, as well as off-specification liquid disposal. The system can incorporate the dual product liquifiers, seamlessly making N<sub>2</sub> and O<sub>2</sub> or N<sub>2</sub> and Argon

**Efficient**  
**Versatile,**  
**Moveable**  
**Safe**  
**Cost-effective**



- Safe shipping and rapid deployment / relocation
- Ships in standard 45 foot high-cube containers
- Eliminates expensive on-site engineering and labor
- Interface skid provides product piping insulation
- Flexible product connections to all the skids
- Single point electrical connection
- Single point control connection
- Lighting included
- Remote dial in for: problem solving; quality control and production trending
- IP55 dual door waterproof enclosures
- PLC automatic cool down and loss of prime detection for all pumps
- VFD control for the transfer pumps
- Rigorous testing at the point of manufacture
- Flawless and rapid commissioning in challenging or remote locations
- Independent control from main ASU plant PLC HMI
- Each Tank has a touch-screen HMI
- Safety as a priority, the system includes safety and vent valves
- Easy access for equipment maintenance
- The Oxygen pumps are fitted with Stainless Steel 6mm blast shields
- The tanks utilize gravity filling with vapor return lines to the plant to minimize transfer and flash losses

## CUSTOMIZABLE SCOPE:

- A interface skid to tie all components together, for one or two tanks , transfer pumping skid, high pressure pump, HP vaporizer for cylinder filling and a dump vaporizer
- 25 /50 /75/ 100 m3 vacuum + perlite insulated horizontal type storage tank designed to ASME sec. VIII div. I Ed.2010 with “U” stamp certification. PED as a option
- ACD transfer pumps with VFD controls for road tanker or VIE filling
- ACD P2K cylinder-filling pump for cylinder filling features a vertical pump with a dual wrist-pin bearing design, allowing higher rod loading and greater drive-end life. Vacuum jacket at cold end minimizes the losses
- Customizable Vaporisers for Customer pipeline backup or HP Cylinder filling requirements
- A state-of-the-art Siemens PLC Control System with HMI touch-screen Electrical and PLC panels.
- Tank has a pressure build-up coil to allow for pressure decants from the tank if necessary
- A VFD transport pumps
- Insulated Pump suction lines with aluminum weather-proof jacketing
- Independent liquid feed lines are provided to all pumps, facilitating separate operation of the Transfer pump and Cylinder Filling pump
- Interface between the plant PLC and the tank PLC system so that both systems can be viewed from either location
- The PLC includes the automatic cool down protection, loss of prime on both pumps as well as the tank level and pressure indication
- HMI screen incorporate a sun shield for easy viewing in bright environments
- The design includes safe disposal of liquid from safety and vent valves
- Easy access for equipment maintenance







Cosmodyne is a world leader in the design and manufacture of air-separation plants SINCE 1977, Each Cosmodyne system is designed and built to rigorous standards of quality and workmanship developed from nearly a half century of experience. From proposal to installation, our sales, engineering, manufacturing and field service personnel continually demonstrate our commitment to customer satisfaction.



This commitment does not end with delivery – our field service staff are ready to serve you **24 hours a day**, wherever you are. With over 450 functioning plants around the world we continue to set the industry standard for design, manufacture, sales and field-service.



Cosmodyne offers a wide range of plants under 300 metric ton/day. This brochure covers the smaller plants under 31 metric ton per day. Please contact us for any requirement over 31 metric ton/day



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