

Pre-engineered Sample Systems for TALYS ASP400 series with fiber optic interface

The TALYS ASP400 series FT-NIR analyzer is designed to offer a simple base analyzer with a range of pre-engineered sampling interfaces suitable for use in a refinery location with various levels of requirement for hazardous zone placement of analyzer and sample handling.

Measurement made easy

Interfacing to a process stream

The TALYS ASP400-Ex is a single-point fiber optics based industrial FT-NIR analyzer designed for in-line monitoring and control of continuous processes. It enables real-time process monitoring, determination of stream properties or physical qualities, process characterization and early troubleshooting.

This robust analyzer has features which include a simple installation with small footprint and embedded controller (no analyzer PC required) and a low cost of ownership with virtually no scheduled maintenance for 5-years. The Ex Area purge controller is integrated with base enclosure and provides full connectivity to DCS via Modbus TCP/IP, RTU and OPC.



The TALYS ASP400 series FT-NIR analyzer is suitable for a wide range of refinery process monitoring applications including naphtha conversion units such as catalytic reforming, isomerization, naphtha hydro-treating and steam-cracking as well as applications in HF alkylation, gasoline blending and LPG.

This process analyzer is offered with a number of pre-engineered process stream sample interface options as described in this datasheet.

TALYS ASP400 Series sampling interface package solutions

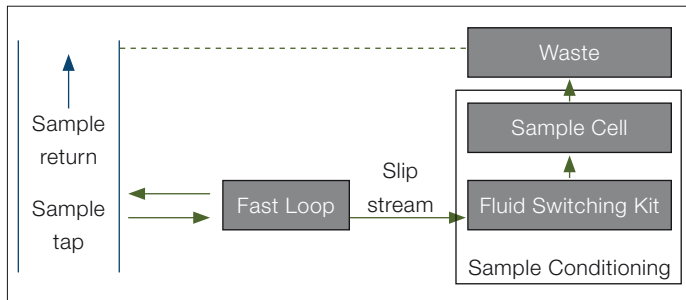
Introduction

ABB fiber optic based analyzers may be used to measure chemical and physical properties within a variety of processes. In order to analyze a sample, the analyzer must either be brought to the sample (in-situ) or the sample brought to the analyzer (extractive).

In-situ probes have the simplicity to be inserted directly in the sample line however this creates a significant challenge with the varying pressure and temperature of a process line. Extractive sampling has the advantage of allowing tighter control of sample conditioning for pressure and temperature resulting in a higher measurement precision and better application reliability. Where feasible, it is the preferred sampling option for demanding refinery hydrocarbon stream measurements.

Sampling interface package solutions

The TALYS ASP400 series of FT-NIR analyzer solutions is designed to offer a simple base analyzer with a range of pre-engineered sampling interfaces suitable for use in a refinery location with range of requirements for hazardous zone placement of analyzer and sample handling. The most common way to extract a sample from a given sample stream is to define a sample handling system with a fast loop to allow fast circulation of the sample and take a smaller sample amount via a 'slip stream' to send to the sample cell which may be more easily conditioned.



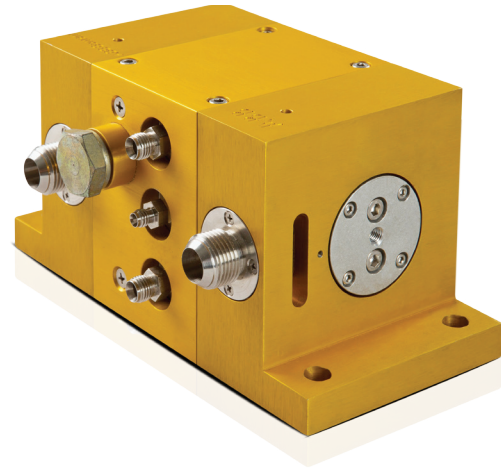
Three pre-engineered sample interface package solutions are offered for the TALYS ASP400 and ASP400-Ex series.

Packaged analyzer systems utilizing the TALYS ASP400 Ex base unit

Ex Flow	The base Ex unit with integrated sample bypass
Through Cell	and flow through sample cell in enclosure
Ex Manual	The base Ex unit with sample system including sample cell with sample bypass without I/O control (i.e. manual) in enclosure
Ex Auto	The base Ex unit with sample system including sample cell with sample bypass with integrated I/O control (i.e. automatic) in enclosure

Included with each sample system:

- Fiber-optic coupled transmission liquid cell



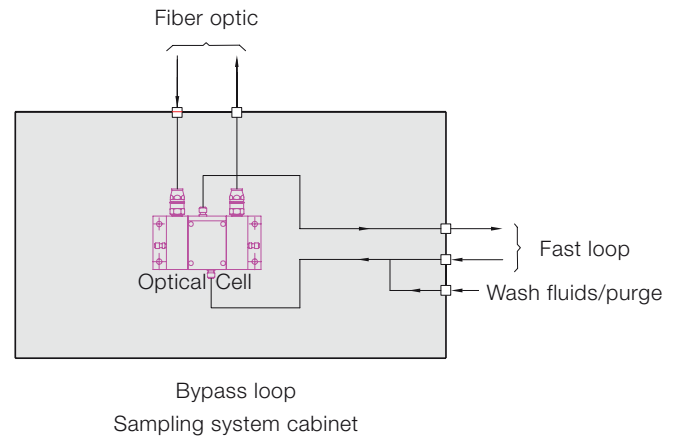
Sampling options are also available:

- Coalescing filter to limit water content in the sample (available for the Auto and Manual packages only)
- Auto grab module for automatic capture of a process sample for laboratory standard test method (available for the Auto package only)

TALYS ASP400-Ex Bypass flow through cell

TALYS ASP400-Ex Bypass flow through cell

In this pre-configured sample system, the flow through cell is placed directly in a by-pass loop stream as the simplest and most cost-effective sample extraction system. A large volume flow on the sample cell allows the sample to be measured without a separate slip stream required. The components are plate mounted with no enclosure. While it provides simpler interface at lower cost, this system is limited in ability to condition the sample for temperature.



Bypass with Flow Through Cell Sample System cabinet

Includes:

- Fiber-Optic coupled Flow through liquid cell with fixed optical path length
- Bypass loop with flowmeter
- Single Manual valve for purge/wash injection
- Analysis on continuous flow
- Cell Material (MAT'L): Stainless Steel 316
- Window Material: Sapphire
- Path length (PL): Selectable at time of ordering between 2-10mm (customer to confirm) default is 2mm
- O-Ring Material (SEAL MAT'L): Kalrez™ (customer to confirm)
- All fittings and tubing sizes are Imperial (3/8-inch Bypass loop)
- All fittings are Swagelok®

Operational Specifications

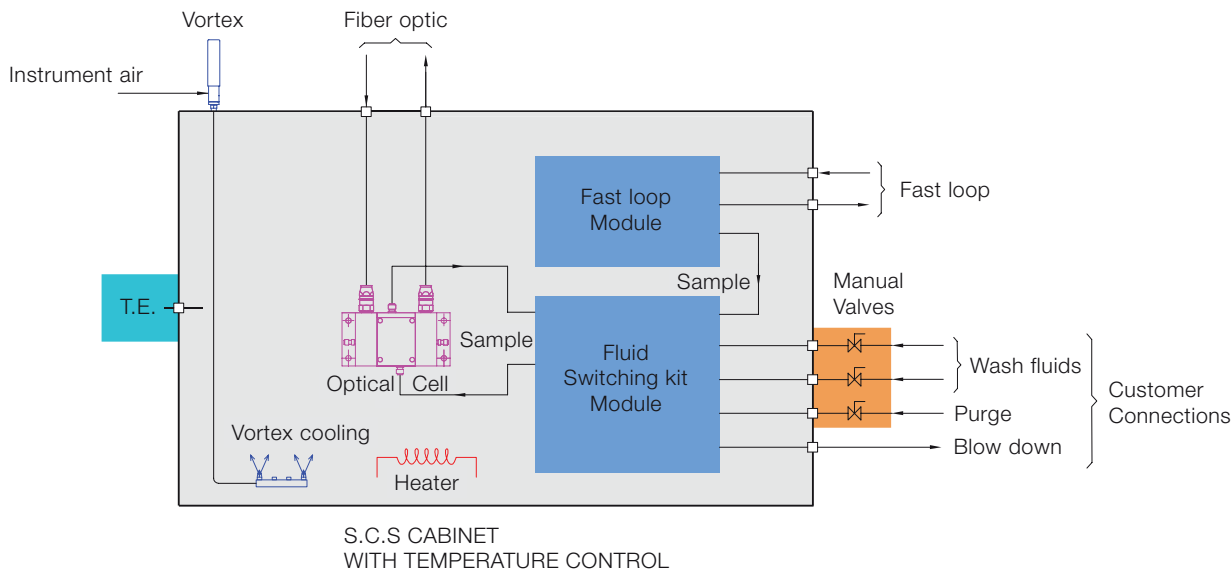
- Max Operational Process Pressure 20bar; short term 25 bar
- Max Operational Temperature with Kalrez™: 225°C; short term 250°C
- Max rate of Temperature Change 10°C/minute

Requirements/limitations

- Requires N₂ or dry Instrument Air (-40°C dew point) at 5 liter/min for Cell Purge
- Requires N₂ (-40°C dew point) for cell reference (non continuous flow)
- No Grab Sample facility
- Cabinet not controlled in temperature

TALYS ASP400-Ex Manual

In this pre-configured sample system, the sample system is completely manual in operation limiting material costs. The sample system is housed in an enclosure which is heated for frost resistance and temperature maintained with a vortex air system.



Legend ISA:

T.E. = Temperature sensor
T.T. = Temperature transmit

Note: this is a generic block-diagram to provide a system overview only

Manual Sample Conditioning System heated cabinet

One Basic Sample Conditioning System cabinet, temperature controlled required when sampling cell is in the cabinet.

Includes:

- Fiber-Optic coupled liquid cell (ACC115) with default path length 2mm
- One Fast Loop Module
- One manual fluid selection module
- Insulated cabinet; approx. dimensions: 36»w x 48»h x12»d
- Cabinet temperature electrically controlled with hazardous area certified heaters and thermostat
- Default setpoint: 25°C (see note)
- Continuous cooling with vortex
- Suitable for Class I Division 1 or ATEX Cat II 2G T3 temperature rating, for hazardous area operation.

Requirements/limitations:

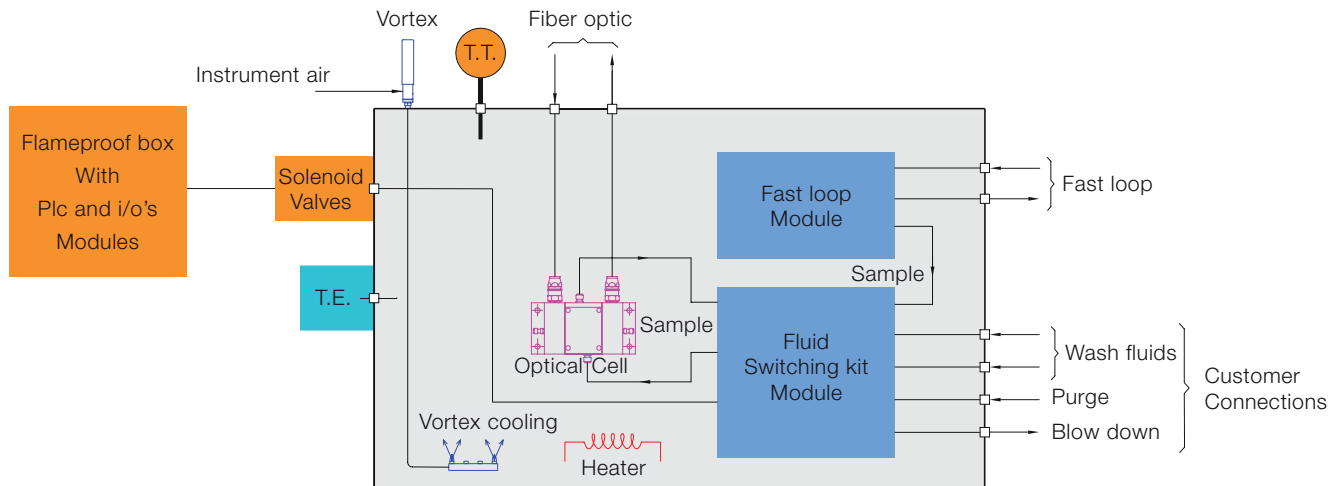
- Fiber optic pull box not included
- Requires Inst. Air at 70 PSIG / 15SCFM for Vortex Cooling and actuation of valves
- Requires N₂ or dry Instrument Air (-40°C dew point) at 5 liter/min for Cell Purge
- Requires N₂ (-40°C dew point) for cell reference (non-continuous flow)
- 110 or 220 VAC [To be specified when ordering.]

Note:

- Cabinet includes sufficient Heating to have delta T of 50°C between the inside cabinet set point and minimum ambient temperature.
- Cabinet should be protected from direct sunlight and falling rain.

Please specify desired set point temperature and Min-Max ambient where the cabinet will be mounted.

TALYS ASP400-Ex AUTO



Fully automated sample conditioning system heated cabinet

One Basic Sample Conditioning System cabinet, temperature controlled required when sampling cell is in the cabinet.

Includes:

- Fiber-Optic coupled liquid cell (ACC115) with default path length of 2mm
- One Fast Loop Module
- One automatic fluid selection Module
- Insulated cabinet; approx. dimensions: 36»w x 48»h x12»d
- Cabinet temperature electrically controlled with hazardous area certified heaters and thermostat
- Default set point: 25°C (see note)
- Continuous cooling with vortex
- Flameproof I/O box for hazardous area
- Suitable for Class I Division 1 or ATEX Cat II 2G T3 temperature rating, for hazardous area operation.

Requirements/limitations:

- Fiber optic pull box not included
- Requires Inst. Air at 70 PSIG / 15SCFM for vortex cooling and actuation of valves
- Requires N₂ or dry Instrument Air (-40°C dew point) at 5 liter/min for Cell Purge
- Requires N₂ or dry Instrument Air (-40°C dew point) for cell reference (non-continuous flow)
- 110 or 220 VAC [To be specified when ordering.]

Note:

- Cabinet includes sufficient Heating to have delta T of 50°C between the Inside Cabinet set point and Minimum ambient temperature.
- Automatic grab sample is available as option
- Cabinet should be protected from direct sunlight and falling rain.

Please specify desired set point temperature and Min-Max ambient where the cabinet will be mounted.

Technical details

Fiber-Optic coupled transmission liquid cell*	By Pass*	MANUAL	AUTO
Fiber-Optic coupled transmission liquid cell	✓	✓	✓
Fixed optical pathlength: 0.375mm - 5mm (ordered separately)	✓	✓	✓
Material in contact with sample:	✓	✓	✓
Stainless steel 316 cell body, temperature sensor port, 90° parallel fiber-optic ports inputs	✓	✓	✓
Includes doubled O-ring seals and windows	✓	✓	✓
Maximum operating temperature -20°C to 250°C (with Perlast (Perfluoroelastomer FFKM) O-rings)	✓	✓	✓
Maximum operating pressure 50 Bar (with Sapphire windows)	✓	✓	✓
Maximum operating pressure 16 Bar (with BK7 windows)	✓	✓	✓
Requirements/limitations:			
Continuously purged optical path of fiber optic cell. (See option for membrane dryer)	✗	✓	✓
Requires N ₂ or dry Instrument Air (-40°C dewpoint) at 5 liter/min for Cell Purge	✗	✓	✓
Requires N ₂ or dry Instrument Air (-40°C dewpoint) for cell reference (non continuous flow)	✗	✓	✓
Notes:			
Includes one set of spacer and windows (specify when ordering)	✗	✓	✓
*These specifications are based on the ACC115 cell. For Series 750 Hi-Flow Cell specifications differ slightly and are available on request.			
Optional Coalescing Filter Module (added to slip stream of Fast Loop filter)	By Pass	MANUAL	AUTO
Heat exchanger	✗	✓	✓
Coalescing filter for removal of water	✗	✓	✓
Coalescing filter Bypass flowmeter and needle valve	✗	✓	✓
Module is plate mounted	✗	✓	✓
Requirements/limitations:			
Requires cooling water at 17°C +/-3°C	✗		
		✓	✓
Notes:			
Will require ONE H-EX FILTER item for each Fast loop Module where free water removal is required	✗	✓	✓
The User-provided Cooling Water utility supply to the heat-exchanger must be sufficiently low temperature to ensure the water removal takes place with the sample temperature BELOW the measurement temperature in the Analyzer flow cell (normally 25°C). If this condition is not observed water fall-out in the measurement cell may still occur.	✗	✓	✓
Optional Auto grab Module (for AUTO only)	By Pass	MANUAL	AUTO
One Auto-fill 2000cc cylinder for automatic outlier sample collection for calibration modeling and laboratory analysis	✗	✗	✓
Quick Connect for ease of retrieval	✗	✗	✓
Suitable for Class I Division 2 or ATEX Cat II 2G T3 temperature rating, for hazardous area operation	✗	✗	✓
Module is plate mounted	✗	✗	✓
Notes:			
Auto Grab automated valves are pneumatically actuated, via 1/8" (3.1mm) tubing, between Solenoids and sampling system.	✗	✗	✓
70 PSIG instrumentation air pressure minimum needed.	✗	✗	✓
DO module and Solenoid valves included.	✗	✗	✓
All fittings and tubing sizes are Imperial.	✗	✗	✓
All fittings are Swagelok®	✗	✗	✓

Fast Loop Module (for ONE light hydrocarbon stream)	MANUAL	AUTO
One process sample input	✓	✓
One Swirl-clean, fast loop & filter (hydrophobic membrane)	✓	✓
One Fast loop flow meter	✓	✓
One process sample return	✓	✓
One sample slipstream output	✓	✓
Sample slipstream regulator to control sample pressure to analyzer	✓	✓
Manual Grab sample tap for calibration modeling and laboratory analysis	✓	✓
Module is plate mounted	✓	✓
Requirements/limitations		
Maximum Sample Inlet Pressure: 300 PSIG; 20 barg	✓	✓
Maximum Sample Return Pressure: 250 PSIG; 17 barg (30 psig minimum pressure drop with Sample Inlet)	✓	✓
Fast loop flow:	✓	✓
Maximum: 200 GPH; 800 l/h	✓	✓
Typical: 115 GPH; 450 l/h	✓	✓
Maximum Sample Slipstream Pressure: 200 PSIG; 14 barg	✓	✓
Notes:		
All fittings and tubing sizes are Imperial (3/8-inch Fast loop and 1/8-inch Slipstream)	✓	✓
All fittings are Swagelok®	✓	✓
No free water to be present in Analyzer Slipstream	✓	✓
Will require Coalescing Filter Module option if stream contains more than 100ppm Water at 25°C. (See H-EX-filter option)	✓	✓
Fluid Selection Module	MANUAL	AUTO
Sample low flow indication	✓	✓
Alarm included via intrinsically safe (IS) signal	x	✓
Sample Shut Off valve for sample stabilization	x	✓
Analysis in continuous flow	✓	x
Automatic valves for reference and cell wash	x	✓
Manual valves for reference and cell wash	✓	x
Suitable for Class I Division 2 or ATEX Cat II 2G T3 temperature rating, for hazardous area operation	✓	✓
Module is plate mounted	✓	✓
Requirements/limitations:		
Requires sample input from filtered bypass fast loop module system (fast loop module system not included)	✓	✓
Requires nitrogen and wash fluid inputs for cell wash and referencing (wash fluid cabinet not included)	✓	✓
Requires Instrument Air at 70 Psig actuation of valves	x	✓
Digital Output module and Solenoid valves included	x	✓
Notes:		
All sample flow tubing is 1/8"-inch. Make sure sample will flow adequately	✓	✓
All fittings and tubing sizes are Imperial	✓	✓
All fittings are Swagelok®	✓	✓

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